PUBLIC HEALTH REPORTS

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frontispiece

Stela in Glyptotek Museum, Copenhagen, Denmark, dating back to the late 18th or 19th dynasty, shows a Babylonian, Rem, whose atrophied leg is characteristic of paralytic poliomyelitis.

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PUBLIC HEALTH REPORTS

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
MARION B. FOLSOM, *Secretary*
PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*

Emergency Handling of Frozen Foods

By JOHN B. HOZIER, M.D., M.P.H., and JAMES A. ANDEREGG, C.E., M.S.

IN HIS REPORT on Hurricane Carol, which swept through New England in September 1954, the Public Health Service regional medical director in that area observed: "An interesting phase of the recent disaster was that the primary public problem arose from the loss of electric service. With the loss of electric power, food freezing and storage equipment failed and large quantities of perishable food in wholesale lots had to be disposed of in such a manner that it would not be scavenged."

With the great expansion of the frozen food industry during the past decade, the emergency handling of frozen foods has become increasingly important. In this paper, we shall consider two major types of emergencies: those due to possible contamination of the food in the event of enemy attack with radiological, biological, or chemical weapons and those due to failure of the refrigerating mechanism, such as occurred in the wake of Hurricane Carol. Many questions concerning the problems posed by these emergencies remain to be answered, but a few guidelines have been developed for use in planning to meet them.

Dr. Hozier is chief of Health Emergency Planning, Office of the Surgeon General, Public Health Service, and Mr. Anderegg is sanitary engineering consultant with this unit. *The paper was presented at the 1955 meeting of the Southern Branch of the American Public Health Association in New Orleans, La.*

Protection From Contamination

Much has been written in recent months about the hazards of radioactive fallout following an enemy attack with atomic weapons. As far as is known now, the danger to frozen foods probably can be dismissed with the comment that such foods in unbroken packages should be safe. Frozen food in homes is not only packaged, but it is also kept in well-insulated and closed refrigerators or freezing units. Frozen food in commercial storage has the additional protection of well-constructed, heavily insulated, and tightly sealed buildings.

To verify the assumed safety of packaged food products, the Federal Civil Defense Administration sponsored a series of tests on the ability of such foodstuffs to withstand atomic blasts during the atom bomb testing program in Nevada. The tests were directed by the Food and Drug Administration in cooperation with the Department of Agriculture and private industry. One of the tests, conducted in the spring of 1955 with cooperation from the Association of Frozen Food Manufacturers, concerns frozen foods and frozen food containers, and FCDA is expected to publish the findings in the near future. It will be interesting to see whether packaged frozen foods under actual conditions of an atomic blast come up to the expected standards of safety.

Frozen foods in unbroken packages are also fairly well protected from contamination by biological or chemical agents. In the manual, "Defense Against CBR Attack," the Department of Defense has tabulated the effectiveness of various types of protective packaging (*1*). Sealed cans, according to the manual, afford complete protection against vapors, liquids, biological organisms, and radioactive dusts. Cellophane and metal foil packaging provide complete protection if all joints are tight and if the cellophane has been kept dry. Ordinary paper containers furnish only poor to good protection against these four types of contamination. These evaluations, however, are pertinent only to situations in which the food is protected by packaging alone, that is, where the food is outside a home freezer or where a contaminating agent has been introduced into a commercial freezer warehouse. As previously noted, the nature of the home freezing unit and of the commercial warehouse normally assures that known contaminating agents will not penetrate as far as the individual food packages.

Preservation During Power Failure

Failure of electric power, which was the cause of a food handling emergency during Hurricane Carol, has occurred frequently as a result of natural disasters. In planning for an unexpected, prolonged period without electricity, consideration must be given to the preservation or the consumption of large quantities of frozen and refrigerated foods so that spoilage will be held to a minimum.

The first and most obvious question in regard to this type of emergency is: How long can frozen foods be kept either in a home freezer or in a refrigerated warehouse before they begin to spoil? The answer is elusive and variable and is dependent on several factors. Tests by the Department of Agriculture indicate, however, that frozen foods can be stored in a typical small home freezer without power for about 3 days (*2*). The National Association of Refrigerated Warehouses reports that an informal survey among its members drew responses of anywhere from 1 day to 2 weeks in answer to the question: How long will your warehouse store frozen food without power?

Among the many factors that determine the length of time frozen foods can be kept without spoiling during a power failure in either a home freezer or a commercial warehouse are these:

1. Type, quantity, and condition of the insulation of the freezer or warehouse.
2. Temperature within the freezer or warehouse at the time of power failure. The colder the food, the longer it will stay frozen.
3. Type of products stored. Frozen meats, for example, will absorb heat much more slowly than frozen baked foods.
4. How full the freezer or warehouse is at the time of power failure. Generally, a full freezer will hold frozen foods hours longer than an almost empty one. Thus, once the power has failed, frozen foods serve as a temporary refrigerant in delaying temperature rise. By the same reasoning, a large box will keep foods frozen longer than a small one.

5. Whether or not it becomes necessary to open a freezer or warehouse. This is the most important of all the factors influencing holding time. Once power has stopped, frozen food storage units should not be opened except to transfer the food elsewhere or to add dry ice.

When available, dry ice is the best deterrent to temperature rise, particularly in home freezers. In preparing a community to meet disasters which may entail power failure, officials should locate nearby dry ice manufacturing plants and arrange for large quantities to be delivered, by air if necessary, and distributed during the emergency. Despite the heavy loss of food in New England as a result of Hurricane Carol, considerable quantities of frozen foods which otherwise might have spoiled were preserved with dry ice flown in from communities not affected by the storm.

If dry ice is not available, ordinary ice may be used to prolong the storage life of frozen foods, but it should be used only when the foods show evidence of thawing. Ordinary ice should not be added until foods have begun to soften, since ice temperature usually is just below 32° F., whereas frozen foods normally are stored at about 0° F.

Admittedly, the time may arrive during a period of power failure when it is no longer possible to refrigerate frozen food. Dry ice or ordinary ice, even if available initially, may have been exhausted, and temperatures in home freezers and refrigerated warehouses may have risen so that the foods would spoil if not further preserved. It must be remembered that because of the rupture of cellular structure during freezing, foods that have been frozen deteriorate much more rapidly after thawing than do fresh foods.

Almost any method of preserving fresh food—canning, cooking, salting, smoking—can be used to preserve food that has been frozen. Corned beef may not enjoy as much popularity as a sizzling steak, but most housewives have salt on the pantry shelf and putting a choice cut of meat into a brine solution seems preferable to having to discard it after it has spoiled. Similarly, if heavy spoilage losses are to be avoided, operators of frozen food warehouses must be prepared to cook, or otherwise preserve, thawing food, or to distribute it quickly to persons who can.

Civil Defense Planning

In communities near freezer warehouses, frozen foods may constitute an excellent emergency resource for use in mass feeding operations during a disaster. As pointed out earlier, frozen foods stored in warehouses which remain intact after an enemy attack probably would be safe from contamination. And, because of the imminent danger of food spoilage under assumed conditions of electric power failure, such foods would have to be consumed within a few days. Although some warehouses do have auxiliary diesel electric powerplants, the percentage of warehouses so equipped is relatively small. A proper activity for civil defense officials might be to convince warehouse operators of the advisability of equipping their refrigerated storage units with auxiliary power. From a dollars-and-cents viewpoint, a standby diesel generating unit would seem to be a matter of good business.

As an approach to eventual solution of the many problems involved in protection of foods in time of emergency, the National Research Council, at the request of the Food and Drug Administration, has appointed a committee of experts in food technology to study the subject. The stated purpose of this committee is: "To consider the present preparedness of the food processing and warehousing industry with respect to its vulnerability to overt or covert special weapons attack. If necessary, to recommend corrective measures, or research to develop corrective measures, which will reduce the vulnerability." The National Research Council has been asked to report on the following specific items:

"1. The points where food and the major food processing industries are most vulnerable to overt or covert attack with special weapons.

"2. Corrective measures, or research needed to develop corrective measures, which will reduce this vulnerability.

"3. The suitability of existing facilities and practices for sanitizing or decontaminating food plants, equipment and products in a civil defense emergency.

"4. Any further facilities or practices needed for sanitizing or decontaminating food plants, equipment and products in a civil defense emergency."

It is understood that the study committee's report, anticipated late this year, will include an evaluation of problems in handling frozen foods.

Guides to Preparedness

Despite the many unanswered questions, certain actions can be taken now by local officials in preparation for preservation and proper use of frozen foods during an emergency period:

1. Locate existing refrigerated warehouses and encourage operators to provide auxiliary power sources if they have not already done so. Such standby power could save not only the frozen food stored in the warehouse, but also individual homeowners' stocks, which could be transferred to the warehouse until power is restored in the area.

2. Encourage decentralization of new warehouses away from centers of likely target cities.

3. Locate dry ice manufacturing plants and plan for prompt distribution of dry ice to owners of home freezer units in event of power failure. This may include planning for importation of dry ice if it is not manufactured locally.

4. Educate the public on procedures to follow in the event of power failure. The individual home owner should know that dry ice is, or is not, available—and where; that freezer units should be kept closed insofar as possible; and that frozen meats and other frozen foods can be preserved for later use only by cooking or otherwise preserving them as soon as they begin to thaw.

5. Prepare an estimate of the numbers and capacities of mobile freezer units, such as trucks and railway cars, that may be available. Some frozen food, particularly that stored in warehouses, might be saved by transfer to these vehicles.

6. To meet the eventuality that all possible sources of power may be destroyed, a plan should be prepared for rapid distribution of large stocks of frozen foods to minimize waste.

We all hope, of course, that the occasion for the use of emergency measures may never arise in our own communities. However, the annual number of natural disasters alone is ample indication of the immmediate need for planning the preservation of the Nation's food supply during an emergency.

REFERENCES

(*1*) U. S. Department of the Army: Defense against CBR attack. Field manual 21–40. Washington, D. C., U. S. Government Printing Office, 1954.

(*2*) U. S. Department of Agriculture: What to do when your home freezer stops. Leaflet 321. Washington, D. C., U. S. Government Printing Office, 1952.

Departmental Announcement

Herold C. Hunt, Ed.D., Charles William Eliot professor of education at Harvard University, and former general superintendent of schools in Chicago, was appointed Under Secretary of Health, Education, and Welfare by President Eisenhower on Sept. 2, 1955. For more than 25 years, Dr. Hunt has held responsible administrative positions in public schools, among them superintendencies at St. Johns, Mich.; Kalamazoo, Mich.; New Rochelle, N. Y.; and Kansas City, Mo. He has also lectured at summer sessions of several universities. He has held important positions on many professional education associations, serving as president of the American Association of School Administrators from 1947 to 1948, and as chairman of the American Council on Education in 1948–49.

Recommendations for the Improvement of Fetal Death Statistics

A report by the United States National Committee on Vital and Health Statistics. The committee was formed by the Surgeon General of the Public Health Service at the request of the Department of State in accordance with the recommendations of the First World Health Assembly, 1948. The major objectives of the committee, of which Dr. Lowell J. Reed, Johns Hopkins University, is chairman, are to promote and secure technical developments in the field of vital and health statistics for national and international use.

• • •

FETAL MORTALITY is a problem of considerable importance in the United States today. Estimates indicate that fetal deaths now represent a medical and social problem of equal or greater magnitude than that of infant mortality at the turn of the century. In view of this, it seems important that health interests throughout the country turn more attention toward this problem.

More reliable and complete data on fetal mortality are needed to identify the problems in a more precise manner. As a step toward obtaining improvement in fetal death registration, and the reporting, classifying, and tabulating of causes of fetal deaths, the United States National Committee on Vital and Health Statistics is proposing certain recommendations. These recommendations and background information on their development are presented in this report.

Early in 1951 the National Committee on Vital and Health Statistics established a Subcommittee on Causes of Fetal Death. Its major objective was to recommend methods for improving the recording and processing of statistics on fetal deaths so that they would be more suitable for use in studies of medical and social factors related to these fatalities.

A preliminary review and summary (*1*) sponsored by the national committee indicated the magnitude of the problem and its many ramifications. Most important is the extraordinarily large number of deaths for which the cause is either unknown or is reported in ill-defined terms.

One of the greatest deterrents to adequate progress in the field, it was thought, was the lack of clear-cut and acceptable definitions of terms such as stillbirth, abortion, evidence of life, prematurity, and viability. The adoption by the Third World Health Assembly in 1950 of definitions of live birth and fetal death and a number of accompanying recommendations was an important constructive step in the field (*2*), making it unnecessary to use "stillbirth," "abortion," and "viability" for vital statistics purposes. However, many important problems remain, particularly with regard to the application of definitions.

Basic problems in the recording and classifying of causes of fetal death stem from the difficulty of relating clinical observations during the life process to pathological findings and are further complicated in that two individuals must be considered, the fetus and the mother. As a result, recorded causes often go no further than describing terminal condition and provide little data on underlying causes.

This lack of knowledge of underlying causes, especially in the group of antepartum deaths,

is probably responsible for the prevailing feeling of apathy on the part of the clinician in his approach to the problem. There is a discouraging lack of useful information on most clinic records of maternity patients. The same feeling of apathy is evident in the field of vital statistics and is reflected in the fact that few, if any, tabulations on causes of fetal deaths are prepared in the local, State, and national offices of vital statistics.

It was recognized, from the beginning, that there are two major tasks requiring attention. One relates to specific problems: definitions, medical certification, classification, and the like. The other, a broader function, is that of acting as a coordinating force for groups concerned with the problem of fetal loss.

It was also recognized that, to do effective work in either of these areas, the subcommittee's activities must be linked to and must benefit from the experience and knowledge of the physicians practicing obstetrics, pediatrics, and of related professional groups. The subcommittee operated on the basic principle that sources of information outside the group were to be utilized to a maximum in arriving at recommendations. This led to conducting a major survey of medical opinion, testing of a form in two hospitals, review of case histories of fetal deaths, and examination of tabulations of data for evidence of relationships under question, and other activities. As a result, the recommendations represent the results of careful study and reflect a broadly based point of view.

In addition, steps were taken in the direction of the broader mission originally projected. Liaison was established with the Committee on Fetus and Newborn, of the American Academy of Pediatrics, and with the Public Health Conference on Records and Statistics. The Academy of Obstetrics and Gynecology was advised of the subcommittee's program; the attention of chiefs of obstetrical service in many of the teaching hospitals and medical schools was sharply focused on questions affecting the development of statistics; and early recommendations of the subcommittee were widely publicized by the National Office of Vital Statistics, Public Health Service.

There is evidence that these actions have contributed to the current increase in interest in fetal mortality. But it is clear that a need still exists for a continuing committee. Such a group, composed of representatives from the disciplines concerned, would provide a forum for the exchange of ideas on scientific, administrative, and reporting issues, and for the promotion of activities designed to reduce reproductive wastage. The investigation of the medical, biological, and environmental factors that affect this loss could thereby achieve the high position of priority it deserves.

It is thought, however, that a committee with a much broader base of sponsorship than that of the Subcommittee on Causes of Fetal Death would be required to perform these functions effectively. The appointment of a continuing committee of this type with representatives from the fields of obstetrics, pediatrics, public health, and vital statistics would be an essential step in achieving real progress in the field.

Other recommendations presented in the sections to follow are limited to specific well-defined actions which relate primarily to the improvements in data on the fetal death certificate. Many of these recommendations have already been used extensively by the national and State offices of vital statistics in revising their official certificates of fetal death. The results of 113 responses to a questionnaire sent to obstetricians in 173 hospitals in May 1952 (*3*) aided materially in arriving at some of these recommendations. The specific recommendations relate to:

- Medical certification of causes of fetal death on the standard form.
- Checklists for all conditions of pregnancy and labor and for methods of delivery.
- Time of death (antepartum, intrapartum) to be reported on the fetal death certificate.
- Tabulations on fetal deaths by national and State vital statistics offices.
- Suggested appointment of ad hoc committees to solve specific problems.

Medical Certification

The medical certification section on causes of fetal death on the fetal death certificate should be revised to a sequential arrangement paral-

Figure 1. The recommended sequential arrangement of the medical certification section has been adopted in the 1955 revision of the standard certificate of fetal death (Form PHS–797). Here, parts I and II of item 22—the medical certification section—replace items 20a, "fetal causes," and 20b, "maternal causes," on the 1949 standard certificate.

CERTIFICATE OF FETAL DEATH [1]

STATE OF _____ STATE FILE NO. _____

1. PLACE OF DELIVERY
a. COUNTY
b. CITY (If outside corporate limits, write RURAL and give township) OR TOWN
c. FULL NAME OF HOSPITAL OR INSTITUTION (If not in hospital or institution, give street address or location)

2. USUAL RESIDENCE OF MOTHER (Where does mother live?)
a. STATE b. COUNTY
c. CITY (If outside corporate limits, write RURAL and give township) OR TOWN
d. STREET ADDRESS (If rural, give location)

3. NAME OF FETUS (If given)

4. SEX OF FETUS — MALE ☐ FEMALE ☐ UNDETERMINED ☐

5a. THIS DELIVERY — SINGLE ☐ TWIN ☐ TRIPLET ☐

5b. IF TWIN OR TRIPLET, WAS THIS FETUS DELIVERED — 1ST ☐ 2ND ☐ 3RD ☐

6. DATE OF DELIVERY (Month) (Day) (Year)

FATHER

7. NAME a. (First) b. (Middle) c. (Last)

8. COLOR OR RACE

9. AGE (At time of delivery) _____ YEARS

10. BIRTHPLACE (State or foreign country)

11a. USUAL OCCUPATION

11b. KIND OF BUSINESS OR INDUSTRY

MOTHER

12. MAIDEN NAME a. (First) b. (Middle) c. (Last)

13. COLOR OR RACE

14. AGE (At time of delivery) _____ YEARS

15. BIRTHPLACE (State or foreign country)

16. PREVIOUS DELIVERIES TO MOTHER (Do NOT include this fetus)
a. How many children are now living? _____
b. How many children were born alive but are now dead? _____
c. How many PREVIOUS fetal deaths (*fetuses born dead at* ANY *time after conception*)? _____

17. INFORMANT

18a. LENGTH OF PREGNANCY — _____ COMPLETED WEEKS

18b. WEIGHT OF FETUS — _____ LB. _____ OZ.

19. LEGITIMATE — YES ☐ NO ☐

20. WHEN DID FETUS DIE — BEFORE LABOR ☐ DURING LABOR OR DELIVERY ☐ UNKNOWN ☐

21. AUTOPSY — YES ☐ NO ☐

22. CAUSE OF FETAL DEATH

I. DIRECT AND ANTECEDENT CAUSES (Enter only one cause per line)

DIRECT CAUSE *State fetal or maternal condition directly causing fetal death (do not use such terms as stillbirth or prematurity).* (a) _____

Due to

ANTECEDENT CAUSES *State fetal and/or maternal conditons, if any, GIVING RISE TO THE ABOVE CAUSE (a) stating THE UNDERLYING CAUSE LAST.* (b) _____

Due to

(c) _____

II. OTHER SIGNIFICANT CONDITIONS *of fetus or mother which may have* CONTRIBUTED *to fetal death, but, in so far as is known, were not related to direct cause of fetal death.*

I hereby certify that this delivery occurred on the date stated above and the fetus was born dead.

23a. ATTENDANT'S SIGNATURE (Specify if M. D., D. O., midwife, or other)

23b. DATE SIGNED

23c. ATTENDANT'S ADDRESS

If not attended by physician

24. SIGNATURE OF AUTHORIZED OFFICIAL TITLE

25a. BURIAL, CREMATION, REMOVAL (Specify)

25b. DATE

25c. NAME OF CEMETERY OR CREMATORY

25d. LOCATION (City, town, or county) (State)

26. FUNERAL DIRECTOR ADDRESS

DATE REC'D BY LOCAL REG.

REGISTRAR'S SIGNATURE

[1] Optional heading—CERTIFICATE OF FETAL DEATH (STILLBIRTH).

leling the section on the death certificate. The new form should clearly indicate that conditions in both the fetus and the mother should be considered by the physician when entering cause information. Explanatory material should accompany the certificate when introducing the sequential arrangement.

The change to the recommended sequential arrangement was followed in preparing the revised standard certificate of fetal death, placed in effect January 1, 1955. Figure 1 gives the wording of the section (item 22, "Cause of Fetal Death") adopted by the National Office of Vital Statistics and approved by the Public Health Conference on Records and Statistics.

At the time this recommendation was under consideration, the 1949 standard certificate of fetal death was in effect. There was considerable dissatisfaction with the format of the medical certification section, which was in the form of a two-part question, one part requesting information on fetal causes, the other, on maternal causes. When entries appeared in both parts, it was uncertain which condition the physician

himself considered to be the underlying cause or how the causes were interrelated.

Another problem in attempting to utilize the fetal death record for studying causal factors was the high proportion of ill-defined causes given on the record, or no causes at all.

The change to a sequential arrangement of the certification section is viewed as an important step in overcoming the problems mentioned. One advantage of the recommended arrangement is its consistency with the certification section on the death certificate. As in the case of general mortality, the form provides a basis for determining the physician's judgment as to the underlying cause. It also increases the possibility of studying causes of fetal death as an integrated pattern, that is, the relationship of maternal to fetal causes.

The sequential arrangement was tested briefly in Johns Hopkins University Hospital and Chicago Lying-In Hospital. The participating physicians were favorably impressed by this arrangement and felt that it was more logical than the two-part form. Furthermore, the nationwide survey of many of the leading obstetricians (*3*) indicated that a great majority believed the sequential form provided a better basis for interpreting the cause of fetal death information than the present form.

The following guides are proposed for the use of the sequential arrangement:

1. Method of filling out medical certification section—Causes of fetal death should be recorded in part I (of item 22 on the standard form) in a sequence of pathologically or etiologically related conditions in the mother and fetus, with the injury or morbid condition which initiated the sequence of events being stated last. In part II (of item 22) should be entered any condition of the fetus or mother which may have contributed to the fetal death but, insofar as is known, was not related directly to the causes given in part I.

2. Certainty of causal relationships — A physician should enter information in part I according to the best evidence that he has available. In some cases this approach may lead to conflicting judgments, depending on the physician's background. However, at the present stage of knowledge concerning causes of fetal death, there are few positive guides that can be given to the physician. In view of this situation, the physician should be given full freedom in making entries rather than restricting him by a series of "don't's" on which there may not be agreement. Obviously incorrect (or impossible) statements of cause sequences that might result could be handled in the coding operation as is now being done in the case of general mortality statistics.

3. Use of certain terms—The terms "asphyxia" and "anoxia" should be acceptable as entries on the fetal death certificate. There is a possibility that their indiscriminate use may result. However, in many instances, antecedent causes standing by themselves would be considered incomplete by the physician since they would not be viewed as the cause of death. For example, it could be argued that placenta praevia would not cause the fetal death, but rather it was in the chain of events which cut off the supply of oxygen to the fetus. Recording asphyxia as the direct cause would seem more logical to the physician than banning the use

Subcommittee on Causes of Fetal Death

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of the term. Also, asphyxia and anoxia may at times be highly informative even when they are the only causes given.

4. Entry of "unknown" as cause of fetal death—There are instances when the clinician does not know the causal factors, and "unknown" is the only honest entry that he can make. Despite the dangers inherent in making "unknown" an acceptable term, physicians should be advised that their judgment on the matter will be accepted. An official action of this type would greatly aid in gaining acceptance of the fetal death certificate.

Official agencies are urged to take the following promotional measures to improve the reporting of cause of fetal death data:

1. Development of interest at the local level, particularly among individual physicians, in fetal death statistics—The aid of State and local medical societies and maternal welfare committees should be solicited. There is a growing realization of the importance of fetal death statistics, and the climate is more suitable today for promotional activities than at any other time in the past.

2. Distribution of explanatory materials along with the new certificate—The cover used for binding books of certificates should contain instructions which will remind the physician how to fill out the sequential form.

3. Production and distribution of a film on the need for fetal death statistics on problems in reporting cause information and on methods for filling out the medical certification section—This will require a major effort and should be viewed as part of the long-range approach to dealing with the problem.

New Supplemental Checklists

The present form of reporting "complications of pregnancy and labor" and "operations for delivery" should be replaced by checklists of "conditions present during pregnancy and labor" and "methods of delivery." Effort should be directed at obtaining reports of all conditions, both major and minor. The same checklists, except for inapplicable terms, should be placed on both the live birth and fetal death certificates in those areas that plan to use this type of item.

The checklists shown in figure 2 are suggested as guides for changing the form of the items. Provision should be made for evaluating the completeness and accuracy of information obtained on the checklists and the need for changes in the terms covered.

The change is recommended as a basis for improving the accuracy and completeness of reports on these items. For more than 10 years, medical items on complications of pregnancy and labor and operative procedures (on the 1949 standard certificate of fetal death, they appear as item 21, "State any complications of pregnancy and labor," and item 22, "State all operations for delivery") have been on the records of many States because of their potential value in dealing with modbid conditions present in the mother and child at birth (*4*). However, gross under-reporting and lack of uniformity in the data have appreciably reduced their usefulness (*5*).

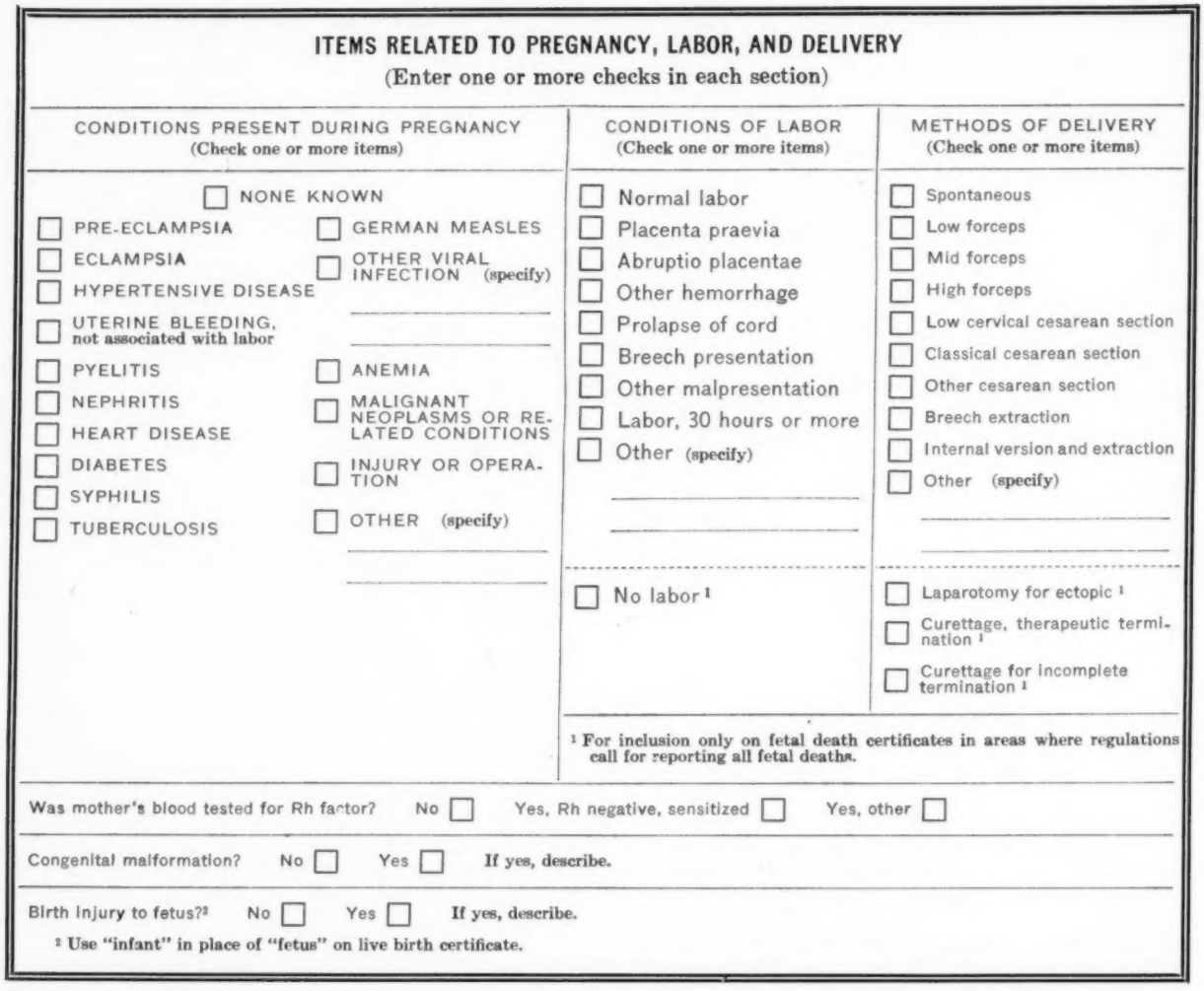
Prior to the subcommittee's study of the problem, the New York State Health Department had designed a checklist form for reporting the information. Despite the hazard of having physicians omit terms that do not appear on the checklist, this approach seemed to offer a convenient and relatively simple method to help overcome present difficulties.

A great majority of the obstetricians surveyed on the matter favored a checklist form (*3*). This survey also elicited suggestions for changes on the New York form and established that the term "complications" in the form's heading, "Complications of Pregnancy and Labor," was being interpreted variously. Specific comments were weighed carefully in arriving at the terminology and lists given in figure 2. Decisions on important points and the reasoning behind these decisions follow:

The term "conditions" replaced "complications" to convey the idea that reports were to be made without regard to severity or physician's judgment concerning the condition's effect on the outcome of the pregnancy.

Instead of having two columns, one headed "diseases related to pregnancy" and one, "other diseases," as in the New York form, it was decided to use a single column with the heading, "conditions present during pregnancy." This single heading eliminates a point which the

Figure 2. The supplemental checklists recommended for inclusion on live birth and fetal death certificates.



ITEMS RELATED TO PREGNANCY, LABOR, AND DELIVERY

(Enter one or more checks in each section)

CONDITIONS PRESENT DURING PREGNANCY (Check one or more items)

- ☐ NONE KNOWN
- ☐ PRE-ECLAMPSIA
- ☐ ECLAMPSIA
- ☐ HYPERTENSIVE DISEASE
- ☐ UTERINE BLEEDING, not associated with labor
- ☐ PYELITIS
- ☐ NEPHRITIS
- ☐ HEART DISEASE
- ☐ DIABETES
- ☐ SYPHILIS
- ☐ TUBERCULOSIS
- ☐ GERMAN MEASLES
- ☐ OTHER VIRAL INFECTION (specify) _____
- ☐ ANEMIA
- ☐ MALIGNANT NEOPLASMS OR RELATED CONDITIONS
- ☐ INJURY OR OPERATION
- ☐ OTHER (specify) _____

CONDITIONS OF LABOR (Check one or more items)

- ☐ Normal labor
- ☐ Placenta praevia
- ☐ Abruptio placentae
- ☐ Other hemorrhage
- ☐ Prolapse of cord
- ☐ Breech presentation
- ☐ Other malpresentation
- ☐ Labor, 30 hours or more
- ☐ Other (specify) _____
- ☐ No labor [1]

METHODS OF DELIVERY (Check one or more items)

- ☐ Spontaneous
- ☐ Low forceps
- ☐ Mid forceps
- ☐ High forceps
- ☐ Low cervical cesarean section
- ☐ Classical cesarean section
- ☐ Other cesarean section
- ☐ Breech extraction
- ☐ Internal version and extraction
- ☐ Other (specify) _____
- ☐ Laparotomy for ectopic [1]
- ☐ Curettage, therapeutic termination [1]
- ☐ Curettage for incomplete termination [1]

[1] For inclusion only on fetal death certificates in areas where regulations call for reporting all fetal deaths.

Was mother's blood tested for Rh factor? No ☐ Yes, Rh negative, sensitized ☐ Yes, other ☐

Congenital malformation? No ☐ Yes ☐ If yes, describe.

Birth injury to fetus?[2] No ☐ Yes ☐ If yes, describe.

[2] Use "infant" in place of "fetus" on live birth certificate.

subcommittee and the obstetricians in the survey had found troublesome, that is, which conditions should be grouped together under each of the columns, "diseases related to pregnancy" and "other diseases."

Qualifications for reporting "german measles"—first trimester—and "anemia"—less than 11 grams hemoglobin—were excluded. It was agreed that, for this type of item, the vital record could not be expected to give all the qualifications. More intensive investigations would have to be based on follow-back studies using the record as the starting point. The decision about anemia was based on the result of correspondence with three outstanding hematologists who indicated that the measurement of hemoglobin level must be supplemented by other observations in order to determine whether a pregnant woman is anemic. There is apparently no agreement on the normal range of hemoglobin in pregnancy.

The item "high forceps" appearing on the New York form was retained in the recommended checklist although this method of delivery is not considered good obstetrical procedure. A byproduct of the statistics will be to indicate how much progress has actually been made in eliminating this method of delivery.

Items on analgesia and anesthesia and induction of labor were suggested by a number of obstetricians in the survey (*3*) but were not included because they would have required too much amplification on the form before useful information could be derived. This decision

was consistent with the general policy of keeping the number of terms in the lists to a minimum and giving priority to those terms that could be stated in a simple, clear, and meaningful way. In line with these objectives other items such as anomaly of cord, contracted pelvis, and other dystocia were excluded.

Time of Death

The standard certificate of fetal death, and subsequently State certificates, should include an item to determine whether the fetus died before or during labor. Use should be made of the information particularly when tabulating cause of fetal death data.

Such an item, which now appears as item 20 on the 1955 revised standard certificate (fig. 1), was also a part of the standard certificate until 1949, when the item was dropped because of an apparent lack of interest.

However, there are now definite indications that distinguishing between fetal deaths that occur before labor and during labor or delivery would greatly aid in understanding causal factors. Statistics tabulated by one of the States demonstrated the marked difference between the two groups in the distribution of causes of death. For example, placental and cord conditions were given as causes for a third of the fetal deaths that occurred "before labor" as compared with similar statements for more than half of the "during labor" group. Also, diseases and conditions of pregnancy and childbirth ranked second in groups of causes of fetal death in the antepartum period but were reported for very few of the intrapartum fetal deaths.

More extensive tabulations of this type and those which take into account such characteristics as age of mother, birth order, and period of gestation would be a great aid to medical research and public health programs.

Tabulations on Fetal Deaths

National and State offices of vital statistics should be encouraged to prepare:

1. Comparable tabulations on fetal deaths and live births in order to facilitate computation of fetal death rates—Attention should be given to comparability in definitions.

A review of published and unpublished data showed that some of the tabulations of fetal deaths did not parallel the detail on live births. This has created problems for the research worker who wishes to compute rates. The tabulation of data on birth order (excluding fetal deaths) for live births and birth order (including fetal deaths) for fetal deaths was cited as a confusing practice. To compute fetal death rates by birth order, data should be available for both live births and fetal deaths on an "including fetal deaths" basis.

2. Experimental tabulations comparing the distribution of cause of death data for early neonatal deaths with cause data for late fetal deaths—For the purpose of this comparison, the term "early neonatal" refers to deaths occurring during the first week after birth, and "late" fetal deaths refer to those of gestations of 28 weeks or more—group III in the international recommendations (*2*).

For the present, the major purpose of these experimental tabulations is to develop a body of data which will clarify the difficulties in comparing causes being certified for fetal deaths and deaths in early infancy. With time, as the reported data improve and coding problems are resolved, the statistics can be studied for evidence of a continuum of conditions affecting the outcome of the pregnancy.

3. Tabulations of causes of fetal death on a multiple-cause basis—In view of the relatively small volume of records involved, preparing multiple-cause tabulations should not prove to be too heavy a burden. Single-cause tabulations would not be highly productive at this stage when so little is known about the causal relationships.

The function of statistics on causes of fetal death is, broadly, to provide information that will be useful in the prevention of fetal loss. Prevention may take the form of an immediate program which requires data on conditions whose etiology is clearly and uniformly understood, or its beginning may be found in slowly evolving research which utilizes data for causal factors whose preventability or etiology may not be known. Single-cause tabulations would not be highly productive for the latter purpose,

which is the more important of the two today. Instead, attention should be focused on multiple-cause tabulations.

No recommendations have been made on the items to be studied in relation to the causes recorded. But it would be desirable to initiate experimental tabulations which relate causes to other medical information and to biological factors such as birth order and age of mother.

Ad Hoc Committees

A number of problems associated with the classification and reporting of causes of fetal deaths and diseases of early infancy emerged in the course of the subcommittee's deliberations. It is recommended that ad hoc committees be appointed to study these problems. Among the problems which were specifically mentioned are:

1. Changes in the Y-code (causes of fetal death code) of the International Classification of Diseases, Injuries, and Causes of Death—Although the Y-code as it now stands appears to be adequate for most purposes, there is a need for reviewing the code principally to see whether any of the causes given in the "ill-defined" category should be treated separately and whether any combinations of causes, as in the case of Y-37, "birth injury," should be provided.

2. Recording of maternal conditions as causes of early neonatal deaths—Where applicable, maternal conditions should be reflected in the medical certification of causes of death for infants who die shortly after birth. However, the physician who fills out the death certificate usually does not have available to him information concerning maternal conditions that may have caused the death. One of the questions needing consideration is how to deal with this issue, which fundamentally requires bridging the gap between the obstetrician and the pediatrician.

There are other practical sides to the issue. For example, a physician who has all of the information concerning the pregnancy may still have to make a choice between a maternal condition whose etiology is not too well known and a condition found in the infant that has a specific meaning for him. Obstetrical and pediatric case histories would undoubtedly clarify the practical problems that would face a physician in applying the principle that appears to be acceptable at this point.

A related question which needs consideration concerns the reconciling of the Y-code (causes of fetal death code) and the "700" rubrics (deaths in early infancy) of the international statistical classification. At the present time the "700" rubrics do not classify maternal conditions that would appear in the medical certification section if the above program were successful.

3. Development of a list of causes of fetal death for physician use—A number of respondents in the survey (*3*) of obstetricians suggested that physicians be furnished a list of acceptable terms to use in entering causes of fetal death. Proponents argue that such a list could be brief, containing basically just those terms which are needed for classification purposes. The counter position is that the list is really a nomenclature which would be difficult to reduce to a manageable set of terms. It is also contended that if the nomenclature and classification listings were viewed as interchangeable the result would be to confuse the physician and either force him into a narrow pattern of reporting terms or cause a breakdown in the reporting.

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The Eighth World Health Assembly

By CHARLES W. MAYO, M.D., and FREDERICK J. BRADY, M.D.

THE Eighth World Health Assembly met in Mexico from May 10 to May 27, 1955. As in past years, the United States delegation to this annual meeting of the member countries of the World Health Organization included officials of government and voluntary and professional health organizations.

Earlier assemblies have reflected the growing importance of the World Health Organization in cooperative international efforts to improve man's health. These assemblies have authorized activities which already are proving surprisingly beneficial: technical assistance to fight malaria and other communicable diseases and to build national health services; worldwide services, such as epidemiological reporting; and mobilization of expert health knowledge in expert committees and seminars. The Eighth World Health Assembly, the first assembly to be held in the Western Hemisphere, made decisions which highlight the value of the work started by the 1946 International Health Conference in New York City where the WHO constitution was drafted.

Atomic Energy

By its constitution, the World Health Organization is established as the coordinating authority on international health work. The Eighth World Health Assembly prepared the way for active participation of WHO in the development of the uses of atomic energy for the purposes of health. It approved plans resulting from careful work done by the secretariat, by the experts on the WHO Executive Board, and by a special consultant group called by WHO in December 1954. The assembly granted the Director-General's request for funds to employ an expert in radioisotopes and to establish a new Expert Committee on Atomic Energy in Relation to Public Health. WHO is expected to take on major responsibilities in sponsoring exchange of information, in training in health protection of those working with, or in the vicinity of, radioactive materials, and in the diagnostic and therapeutic uses of radioisotopes. This authorization of WHO responsibility in the health aspects of atomic energy, parallel to that already authorized in other health fields, indicates the recognition by member governments of the usefulness and potentialities of WHO.

Malaria Eradication

The Eighth World Health Assembly took action also to help put an eventual end to an ancient problem. Malaria, the single most serious worldwide communicable disease, continues to devitalize some 350 million people each year. The governments represented at the assembly voted to shift emphasis forthwith from malaria control to malaria eradication. In recent years, use of DDT and other new insecticides has proved eradication feasible, usually at a cost far below that exacted by halfway measures, which are not fully effective, permit the disease to persist, and require constantly recurring expenditures. The development of mosquito re-

United States Delegation

Chief delegate: Dr. Charles W. Mayo, chairman, Mayo Association, Mayo Clinic, Rochester, Minn.

Delegate: Dr. Frederick J. Brady, assistant chief, Division of International Health, Public Health Service.

Alternates: Dr. LeRoy E. Burney, deputy chief, Bureau of State Services, Public Health Service; Howard B. Calderwood, Office of International Economic and Social Affairs, Department of State; Dr. Martha Eliot, chief, Children's Bureau, Department of Health, Education, and Welfare.

Congressional advisers: The Honorable William H. Avery and the Honorable Thomas E. Morgan, House of Representatives.

Advisers: Dr. Otto Brandhorst, chairman, American Dental Association, St. Louis, Mo.; Dr. A. W. Dent, president, Dillard University, New Orleans, La.; Dr. Harold S. Diehl, dean, University of Minnesota Medical School, Minneapolis, Minn.; Dr. David French, Office of International Administration, Department of State; Dr. William R. Norton, State health officer, Raleigh, N. C.; Miss Agnes Ohlson, president, American Nurses Association, New York, N. Y.; Dr. Arthur S. Osborne, international health representative, Division of International Health, Public Health Service; Dr. Calvin B. Spencer, chief, Division of Foreign Quarantine, Bureau of Medical Services, Public Health Service; Capt. Robert I. Ware, executive officer, Naval Medical School, National Naval Medical Center, Bethesda, Md.; Dr. Charles L. Williams, Jr., chief, Latin American Branch, Public Health Division, International Cooperation Administration; Mrs. Nell Hodgson Woodruff, Atlanta, Ga.

WHO Executive Board

Representative: Dr. H. van Zile Hyde, chairman, chief of the Division of International Health, Public Health Service.

sistance to DDT in some parts of the world suggests there is no time to be lost in eradicating the parasite while it is still possible to control the vector with chlorinated hydrocarbon insecticides. The assembly therefore authorized WHO to place special emphasis on stimulating national governments to intensify malaria eradication programs. This decision by the countries of the world means that many malarious areas, with encouragement and assistance from international agencies like WHO and UNICEF, and from bilateral agencies like our International Cooperation Administration, may free themselves of malaria within the next 10 to 15 years.

As do other WHO programs of technical assistance, malaria eradication abroad has far-reaching implications for our country and for the possibilities of world peace, since it improves conditions of life, morale, and economic productivity of men and women in malarious lands. Thus, the WHO and ICA technical assistance programs are complementary and share many common objectives. The existence of an international health agency, in which nearly all countries of the free world cooperate, has made it possible for countries to join in a common decision to eradicate malaria.

Poliomyelitis

Recent events have dramatized the serious aspects of poliomyelitis. The assembly made a special appropriation to permit WHO to expand its program in poliomyelitis control. This work of coordinating laboratory research and training and strain identification in many countries is an instance of how WHO stimulates and guides worldwide health services. The United States delegation reported to the assembly on the latest Salk vaccine developments in the United States. Other countries, including Canada and Denmark, also presented information on their Salk vaccine programs.

International Quarantine

Another worldwide WHO activity, one which has received great attention and wide support from governments, is the administration of the International Sanitary (Quarantine) Regulations. These regulations, which promote uniformity in quarantine procedures to combine maximum protection against disease with minimum interference with trade and travel, were amended along lines proposed by the United States in order to meet more effectively the requirements of member governments.

Second General Program of Work

In addition to acting on specific program activities, the Eighth World Health Assembly also laid down the general objectives, methods,

President Eisenhower welcomes the WHO visitors on the White House lawn. On the President's left is Surgeon General Leonard A. Scheele and on his right is Dr. Chester Keefer.

and categories of WHO programs for forthcoming years through 1960 by endorsing the second general program of work substantially as drawn up by the executive board. This program underlines the aims of strengthening national health services, training personnel, and of controlling, or eradicating when feasible, major communicable diseases. It places increased emphasis on the planning and development of health as an integral part of economic and social development and on WHO's role of coordination among organizations engaged in

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international health work. No basic changes are made in the lines along which WHO is developing, an indication of general satisfaction on the part of governments with WHO activities.

Scale of Assessments

The assembly undertook a drastic revision of the scale by which the contributions of members are assessed, the first such revision since the establishment of WHO in 1948. One aspect of the revision is that the percentage of the United States assessment will, over a 4-year period (1956–59), be reduced to a level where it is no more than one-third of the total assessment against active members only. This decision is important to the United States so long as some countries continue to be assessed but are inactive and make no payments. While the United States delegation urged full reduction in the United States percentage immediately, many members could not support a rapid corresponding increase in the assessments of other nations. Following the assembly, Congress removed the ceiling of $3 million on the authorization for the annual United States contribution to WHO. The recent announcement by the U.S.S.R. of intentions to resume active membership in WHO may accelerate the adjustment of the scale of assessments.

Budget for 1956

The Director-General had proposed a budget for 1956 which would involve substantially the same amount of assessments against members as in 1955. The payment to WHO of a large number of contributions for previous years resulted in an unexpected increase in available funds and made it possible to provide a higher expenditure level without a proportionate increase in assessments. The assembly voted a total effective working budget of $10,203,084, including several additional items ($42,000 for atomic energy, $309,500 additional for malaria eradication, and an additional $240,000 for costs of technical personnel on joint projects with UNICEF). The assessment against the United States for 1956 will be about $3,410,000, an increase of about $60,000 over that for 1955.

The Value of WHO

We have long believed that the World Health Organization is rightly taking the lead in the international effort to help man remove a burden of ill health that is no longer inevitable or tolerable. It is an effort that is both humanitarian and imperatively realistic. By the same token, WHO is one of the foremost agencies of the United Nations family which is working to build peaceful conditions of life. WHO was fashioned primarily by leaders in the medical and public health professions. It is a technical agency which receives wide support from the people and the governments of the world. Humanity can be proud that this organization continues to develop along lines which are influential and sound, and fosters both public health and goodwill among nations.

Readers' Guide . . .

Post-Assembly Technical Sessions

FOLLOWING the Eighth World Health Assembly held in University City, Mexico, a series of seminars for assembly delegates was conducted in the United States under the general title "Post-Assembly Technical Sessions."

The National Citizens Committee for the World Health Organization sponsored these sessions and invited the delegates. In response, some 146 guests, 40 ministers or directors of health (current or emeritus), and other top health officials from 50 countries visited the United States and attended part or all of the discussions held from May 30 through June 4, 1955. Foreign students receiving medical and public health training in the United States were also among the group.

The seminars included roundtable discussions by 80 physicians, scientists, and administrators (including 3 from other countries—India, Yugoslavia, and Denmark). Questions raised by the visitors were subjects of general discussion.

Fifty private organizations and firms assisted in staging and presenting the seminars; in particular, various drug manufacturing firms gave financial assistance.

President Eisenhower welcomed the visitors to Washington. The President referred to WHO as one of the principal arms of the United Nations and praised WHO campaigns to improve the health of the people of the world. The delegates also were greeted by Dr. Fred L. Soper, director of the Pan American Sanitary Bureau (WHO Regional Office for the Americas) and three officials of the Department of Health, Education, and Welfare—Dr. Chester Keefer, at that time special assistant to the Secretary for medical affairs; Surgeon General Leonard A. Scheele of the Public Health Service; and Dr. Martha Eliot, chief of the Children's Bureau. The National Institutes of Health and the Division of International Health of the Public Health Service assisted the Department and the National Citizens Committee in organizing the Washington seminars.

Moving on to Baltimore, the visitors were welcomed by Dr. Lowell Reed, president of the Johns Hopkins University, and by the faculty of the School of Hygiene and Public Health, and then participated in seminars at the Johns Hopkins University.

The program in New York City included greetings from Dr. Victor Belaunde, then President of the United Nations Security Council; Philippe de Seynes, Under Secretary of the United Nations for Economic and Social Affairs; Dr. Thomas Parran, president of the National Citizens Committee for WHO, and the commissioners of health for New York State and New York City, Dr. Herman Hilleboe (p. 1069) and Dr. Leona Baumgartner.

After the post-assembly technical sessions, some of the visiting health officials attended the scientific assembly of the American Medical Association in Atlantic City.

The following pages contain summaries of some of the seminars. Marked by a cordiality characteristic of the World Health Assembly, the discussions sought to inform health officials of other countries about public health programs and principles in the United States and thus increase their understanding of them and of the importance of United States participation in the World Health Organization.

Design and Construction Of Hospital Facilities

The coordinated and integrated hospital system now developing in this country makes hospital services more accessible and provides better quality care, Dr. Cronin said. Although the hospital bed deficit in 1946 was 900,000, and each year more hospitals become physically or functionally obsolete, notable progress has been made toward providing adequate hospital services in all areas of the country.

Cronin said that there are three kinds of hospitals in this country—governmental, voluntary nonprofit, and proprietary. Exclusive of those operated by Federal agencies, there are approximately 7,000 hospitals in the United States.

A study made in 1942 by the United States Department of Agriculture showed a severe shortage of physicians in rural areas and, further, that 3,100 counties had no hospital services whatsoever.

The Hospital Facilities Survey and Construction Act, passed by Congress in 1946, provided funds to the States for planning and building hospitals and related facilities. Under this law, the Federal Government sets minimum building standards, gives technical assistance, and apportions the available funds to the States on the basis of need. The States are responsible for the use of funds, on a matching basis, by suitable project sponsors in areas with high priority of need. Each State has established a hospital advisory council, with professional and consumer members. It has developed its own hospital service areas on the basis of population and availability of health services, and since 1948, has apportioned its share of Federal funds.

The basic act provided that Federal funds could not be used to build in excess of statewide ratios of 4.5 general hospital beds per 1,000 population, 5 mental beds per 1,000 population, and 2 chronic disease beds and about 1 tuberculosis bed per 1,000 population. One health center is planned for every 30,000 to 50,000 population, depending upon density of population and certain geographic factors.

Since 1948, $600 million of Federal funds and $1,340 million of local and State funds have been committed for 2,500 projects and about 540 health centers which, when completed, will provide 117,000 beds. At this time about 400 health centers and 1,800 hospitals, providing 84,000 beds, are completed and in operation. Of the health centers, 75 were built in conjunction with hospitals, contributing to health maintenance both by preventive and curative types of programs.

Fifty-eight percent of the hospitals have less than 50 beds and are located in towns with less than 5,000 population. They have been built in 700 towns which previously had no acceptable hospital facilities. These hospitals are of infinite value in emergencies. Federal funds have also helped build or improve 30 teaching hospitals at universities and medical schools in 18 States, thus helping to alleviate the shortage of professional personnel in the smaller hospitals.

The program is helping to get physicians and other professional persons to locate in smaller communities. Georgia estimates that 60 physicians have been attracted to the newly opened hospitals. A survey shows that 2 out of 5 registered nurses on duty in the new hospitals came out of retirement to practice in their home areas.

New problems arise, Cronin said, as our life expectancy increases. Although the American population has doubled in the first half of this century, our population over 65 years old has quadrupled, and this trend is expected to con-

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Discussion Leader: John W. Cronin, M.D., chief, PHS Division of Hospital and Medical Facilities.

Discussion Panel: Edward T. Thompson, M.D., chief, Operations Branch, PHS Division of Hospital and Medical Facilities; August F. Hoenack, acting chief, Architectural and Engineering Branch, PHS Division of Hospital and Medical Facilities.

Rapporteur: Jean Allen, information specialist, PHS Division of Hospital and Medical Facilities.

tinue. Patients with chronic diseases now occupy about 25 percent of all hospital beds. The cost for care in general hospitals is more than double that in chronic disease hospitals, thus imposing a heavy burden on long-term patients.

With these problems in mind, Congress in 1954 amended the Hospital Facilities and Construction Act and increased the authorization of funds to include the building of nursing homes and rehabilitation, diagnostic, and treatment centers, and to give added emphasis to the building of chronic disease hospitals. This action should result in a worthwhile contribution to facilities for our aging population.

Mr. Hoenack said that at the beginning of this program there was very little knowledge concerning the design and equipment of hospitals. Through the cooperation of the American Hospital Association, the American Institute of Architects, the Public Health Service, and various schools and manufacturers, helpful guide materials have been developed. Programs must be fully developed before hospitals are built, and all guide materials must be adapted for local use after study of local needs. The chief technical problems of the program have centered around the necessity for educating both designers and users of hospitals.

Dr. Thompson said the program has contributed to better patient care because the facilities operate under State licensing laws and because the majority of them have been accredited by the American College of Surgeons. There are no Federal regulations covering the operation of hospitals.

In reply to a question, Cronin stated the Federal Government funds are used to pay part of the cost of building and equipping hospitals, but Federal funds are not available for their operation. The average building cost of a general hospital bed is now $16,000. A university teaching hospital may cost as much as $30,000 per bed to build.

It is difficult to state the most economical size for a general hospital. Those with more than 200 beds are very expensive to operate because of the variety of services provided. Those between 50 and 100 beds are more economical but cannot give the specialized treatments found in larger facilities.

Project sponsors must give assurance that they have access to funds to defray an anticipated 2-year operating deficit. Hospitals built under this program must be operated by an eligible sponsor for a period of 20 years.

The State agencies determine the percentage of Federal funds to be awarded projects within their boundaries as well as the priority status of the projects.

Advances in Virology And Parasitology

Dr. Rowe discussed the recent advances in the studies of viruses in tissue culture. The use of tissue culture techniques, stimulated by the discovery by Enders and his co-workers of the cytopathogenicity of poliomyelitis viruses for tissue cultures of human cells, has revolutionized the field of virology. Noteworthy advances brought about by these techniques have been the isolation of the virus of rubeola by Enders, of varicella and herpes zoster by Weller, of the mouse and possibly the human salivary gland viruses by Smith, the virus of an epidemic exanthematous disease by Neva and Enders, and the viruses of canine infectious hepatitis and vesicular exanthema of swine.

The discovery of the adenoidal-pharyngeal-conjunctival (APC) viruses was also made

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Discussion Leader: Willard H. Wright, Ph.D., chief, Laboratory of Tropical Diseases, National Microbiological Institute, National Institutes of Health, Public Health Service.

Discussion Panel: Wallace P. Rowe, Ph.D., virologist, NIH Laboratory of Infectious Diseases; Leon Jacobs, Ph.D., parasitologist, NIH Laboratory of Tropical Diseases.

Rapporteur: Paul Weinstein, Sc.D., parasitologist, NIH Laboratory of Tropical Diseases.

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possible by tissue culture techniques. Following the original isolation of these viruses from spontaneously degenerating cultures of human adenoids and tonsils, various members of the group have been found in association with acute respiratory infections. Type 3 has been shown to be the cause of a new clinical entity, pharyngoconjunctival fever; type 4 (RI–67 strain of Hilleman and Werner) and type 7 (Gomen strain of Trygve Berge) have been found to be the cause of a number of febrile respiratory infections in military recruit personnel. The types most frequently recovered from adenoids and tonsils, types 1, 2, and 5, have also been isolated from sporadic cases of acute febrile pharyngitis.

Tissue culture techniques have also been of value in the study of influenza viruses. Following the report of Mogabgab that field strains of influenza viruses are cytopathogenic for monkey kidney tissue cultures, workers at the National Institutes of Health have shown that this procedure is much more highly sensitive than use of embryonated eggs for the isolation of the 1955 strain of influenza B.

Dr. Jacobs, speaking on the newer knowledge of parasitic diseases, discussed primarily the manifestations of human toxoplasmosis. He reviewed acute congenital and acquired disease syndromes and considered in some detail chronic toxoplasmosis of the eye. The opinion was presented that ocular toxoplasmosis of adults may be the most significant manifestation of the infection. This was based on the findings by Wilder in 1952 of parasites resembling *Toxoplasma* in some 50 human eyes enucleated because of chorioretinitis. Serologic tests on 22 of these subjects were all positive at low titer. Also, a correlation was found between chorioretinitis and the presence of *Toxoplasma* antibodies even though here again the antibodies were mostly at low titer. The low antibody levels could be explained on the basis of the persistence of parasites in neural tissue remote from the sites of antibody formation. Final demonstration that this persistence could occur was obtained by the isolation of *Toxoplasma* from the eye of a 30-year-old man with a history of recurrent chorioretinitis of 8.5 years duration and only low antibody levels in the serum.

Knowledge of the epidemiology was given, indicating that the infection is most prevalent in warm, moist areas rather than in cold or hot, dry ones.

The antimalarial drug pyrimethamine was found by Eyles to act synergistically with sulfadiazine against proliferating, but not encysted, forms of *Toxoplasma*. Use of these drugs in presumed cases of adult ocular toxoplasmosis has given encouraging results at the Clinical Center of the National Institutes of Health.

New Developments In Insecticides

Mr. Henderson opened his remarks on the area application of insecticides by stating that the use of chlorinated hydrocarbon insecticides such as DDT has controlled or eradicated arthropod-borne diseases in many areas of the world. Although malaria primarily is a rural disease, control formerly was confined chiefly to urban and suburban communities. Sanitation measures, such as building drains, were relied upon for control of malaria. There was little need for a comprehensive operation team to plan and manage these operations at that time.

Discussion Leader: Justin M. Andrews, Sc.D., associate chief for program, Bureau of State Services, Public Health Service.

Discussion Panel: Winton B. Rankin, M.S., assistant to the commissioner, Food and Drug Administration; Herbert L. Haller, Ph.D., assistant director, Crops Research, Agricultural Research Service, Department of Agriculture; William F. Durham, Ph.D., biochemist, Toxicology Section, PHS Communicable Disease Center; John M. Henderson, M.S., deputy chief, Technical Development Laboratories, PHS Communicable Disease Center.

Rapporteur: Donald R. Johnson, M.S., entomologist, PHS Division of International Health.

Malaria control or eradication now is "big business," and the basic principles of organization and management must be followed in order to attain success. Delegation of authority is one of these basic principles. This applies not only to the delegation of authority from the leader of the program within progressively narrowing bounds down to the individual spray crews, but also to procurement of supplies and obtaining statistical data.

An adequate staff must be chosen to administer the program properly. This staff should consist of medical, entomological, and engineering professional personnel who will work together, using all of their combined skills as a malaria control team. The key person is the team leader, who must fuse the staff functions into a common program as well as obtain the necessary financial support.

Resistance to insecticides now must be considered when developing these programs. The development of mosquito resistance to insecticides is a product of selection pressure, duration of that pressure, and the genetics of the species involved. In regard to *Anopheles* mosquitoes, out of the some 50 significant malaria vectors throughout the world, only 4 or 5 have demonstrated development of resistance. The following are solutions to the resistance problem:

1. The eradication of the disease or the mosquito species.

2. Annual shifting to other insecticides. This is complicated by cross resistance such as occurs in the use of chlorinated hydrocarbon insecticides.

3. Development of new insecticides against which resistance will not develop as rapidly as with the presently used insecticides.

4. Judicious application of insecticides. Larviciding with an insecticide of the same group of material used as an adulticide should be avoided. Adulticiding alone is preferable because larviciding exerts more selective pressure than adulticiding.

It may be desirable to reduce the frequency of insecticidal application and to choose an insecticide with a shorter residual duration. Such material should be applied immediately prior to the malaria season. Baselines should be established in areas where resistance among anophelines has not become apparent in order that we will be able to recognize resistance when it starts.

Dr. Haller talked on the chemical constitution of the new insecticides, which, he said, are among the most important weapons of public health workers. With the aid of the newer insecticides, large international responsibilities in public health have been undertaken. As a result, the worldwide gains made against typhus, dysentery, yellow fever, and malaria are becoming more pronounced. The newer insecticides that have attracted greatest attention may be divided into four broad classes—chlorinated hydrocarbons, organic phosphorus compounds, chemicals that are especially useful with pyrethrum (the so-called synergists), and synthetic pyrethrin-like esters, almost identical in composition with the insecticidal principles in natural pyrethrum. Pyrethrum and the synthetic esters exert a rapid paralytic action (knockdown) on insects, a factor especially important in controlling disease-carrying insects.

Some of the recent developments in insecticide toxicology were brought out by Dr. Durham. During the last 2 or 3 years organic phosphorus compounds have come into general use as insecticides. Malathion, chlorthion, dipterex, and diazinon are noteworthy because they are considerably less toxic than some of the other phosphates being used. Demeton ranks rather high in its oral toxicity to rats but has certain insecticidal advantages by virtue of its systemic effect.

The major pharmacological action of the organic phosphate compounds is their ability to inhibit the enzyme cholinesterase, with a resultant increase of unhydrolyzed acetylcholine leading to signs and symptoms referable to overstimulation of the parasympathetic nervous system.

One sequel of organic phosphorus intoxication is peculiar to certain of these compounds. This is a neurotoxic effect resulting in "jake-leg paralysis." The serious and essentially irreversible nature of this paralytic syndrome makes it desirable to screen the various insecticides of this group for their ability to cause such

paralysis. Chickens appear to be the best available index of a possible paralytic effect in man. The test consists of subcutaneous dosing of atropinized chickens. None of the organic phosphorus insecticides now in general use produced delayed effects corresponding to jake-leg paralysis.

A distinct and different syndrome appeared in hens dosed with malathion and EPN. They developed leg weakness immediately after dosing in addition to the more usual cholinergic symptoms. Although this is not to be interpreted as an indication that a similar effect in man will result from exposure to these compounds by the more usual routes, it is reason for exercising appropriate safety precautions.

When comparing the hazard of dermal versus respiratory exposure to these compounds applied as sprays, it has been indicated that the dermal route is much more important than the respiratory route.

The effect of daily oral doses as high as 35 mg. of DDT daily on man has been extensively studied. Over a 1-year period, no adverse effects attributable to DDT intoxication have been noted. Dilan and endrin, respectively, appear to be about one-fourth and six times as toxic to rats as DDT.

Although there have been a few cases of dieldrin toxicity to spraymen, all those affected recovered. No known toxicity to occupants of houses sprayed with the most commonly used chlorinated hydrocarbons (DDT, dieldrin, BHC) has been reported, and the benefits derived from these materials greatly outweigh the toxic hazards.

In discussing tolerances for insecticide residues on food, Mr. Rankin stated that in 1952, the Food Protection Committee, Food and Nutrition Board, National Research Council, published its "Basic Considerations Involved in Evaluating Hazards Encountered in the Use of Pesticides on Foods," which contains guiding principles for judging the safety of insecticides and other pesticides. In 1954, many of these basic principles were incorporated in a new law, the pesticide chemicals amendment to the Federal Food, Drug, and Cosmetic Act (Public Law 518, 83d Cong.). This law provides a practical method for establishing safe tolerances for residues of pesticide chemicals in certain foods. (Insecticides are one form of pesticide chemicals.) The law prohibits the marketing of food if it bears a residue of a pesticide chemical, unless:

1. The chemical generally is recognized by experts as safe, or

2. Upon consideration of an adequate amount of scientific evidence, the Government has established a safe tolerance for residues of the chemical or has exempted it from the requirement of a tolerance, and

3. If a tolerance has been established, the residues remaining on the food are within the safe tolerance level.

The petitioner who requests the establishment of a tolerance for insecticide or pesticide residues or an exemption from the requirement of a tolerance must submit data to the Government to support his application. Data required in a petition are:

1. The name, chemical identity, and composition of the pesticide chemical.

2. The amount, frequency, and time of application of the pesticide chemical.

3. Full reports of investigations made with respect to the safety of the pesticide chemical.

4. The results of tests on the amount of residue remaining, including a description of the analytical methods used.

5. Practicable methods for removing residue which exceeds any proposed tolerance.

6. Proposed tolerances for the pesticide chemical if tolerances are proposed.

7. Reasonable grounds in support of the petition.

The establishment of tolerances under this new law is only a part of a broader problem, the addition of poisonous or deleterious substances to any food. The Federal Food, Drug, and Cosmetic Act provides a different method for establishing tolerances for poisons which are not pesticide chemicals. Although the method is different, the general principles are the same. The chemical identity of the poisonous substance should be established; the acute and chronic pharmacological properties should be well investigated; there should be trust-

worthy analytical methods for determining the quantities which remain in food; the tolerance should involve an ample margin of safety; and allowance must be made for cumulative effect of the same substances from different sources or of related substances.

Collection and Use Of Statistics

Dr. Dunn, opening the discussion, stressed that statistics help answer the practical questions involved in making program decisions. Health administrators can use statistics to (*a*) identify and measure the extent of public health problems; (*b*) plan, conduct, evaluate, and promote public health programs; (*c*) guide the geographic allocation of health facilities and resources; and (*d*) provide suggested benchmark information needed in epidemiology and in many types of medical research.

In this country, health programs use seven types of statistics. Four of these are essentially repetitive and routinized. They include census data, vital statistics, notifiable disease reports, and the massive reporting of statistics by institutions, particularly the mental institutions. The generally nonrepetitive types include special surveys, research and laboratory statistics, and service statistics (a large part of which may be repetitive).

Dr. Moriyama said that, in the United States, vital statistics consist of data derived from the legal records of live birth, fetal death, death, marriage, and divorce. They also include data on notifiable diseases reported by physicians. Legal authority and responsibility for registration and permanent filing of the records rest in the individual States. Uniformity of basic items and coordination of registration and statistical activities are achieved through joint planning with the National Office of Vital Statistics of the Public Health Service.

In addition to supplying routine vital statistics, he said, the death certificate is used as a starting point in following back to the attending physician or informant for other data, thus serving as the basis for special studies of specific diseases. Vital statistics data have been used for special analytical studies of tuberculosis, cancer, cardiovascular-renal diseases, multiple sclerosis, and motor-vehicle and home accidents.

Statistics of live births and fetal deaths are also widely used for public health purposes. Certificates now contain information on birth weight, which is useful in coping with premature birth problems. Data are also available on complications of pregnancy and labor and on congenital malformations of the live-born child. Moriyama stated that this information is used for followup by local health departments.

Dr. Dauer stated that on the basis of reports from physicians and institutional authorities the State health departments send weekly telegraphic summaries to the Public Health Service. These data, which show the number of reported cases of each of 20 diseases, are published and distributed to international, Federal, State, and local health agencies, and to the press. The data dissemination is rapid, he said, so they may be used effectively. Telegraphic reports are made at once when any of the 6 quarantinable diseases occur. The States also furnish annual figures for 40 diseases.

Dauer explained that for disease control, and other purposes, a system of reporting epidemics or unusual occurrences of diseases has been de-

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Discussion Leader: Halbert L. Dunn, M.D., chief, National Office of Vital Statistics, Public Health Service.

Discussion Panel: Iwao M. Moriyama, Ph.D., chief, Mortality Analysis, PHS National Office of Vital Statistics; Carl C. Dauer, M.D., medical adviser, PHS National Office of Vital Statistics; C. A. Smith, M.D., chief, Venereal Disease Program, PHS Bureau of State Services; Theodore D. Woolsey, biostatistician, PHS Division of Public Health Methods.

Rapporteur: Mort Gilbert, publications officer, PHS National Office of Vital Statistics.

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veloped. State health officers are requested to report epidemiological investigations when a disease occurs in unusual circumstances.

Dr. Smith, discussing the national venereal disease control program, stated all sources of data so far discussed in this meeting have been drawn upon. In addition, specialized morbidity reporting and service statistics have been developed. The reports provided the knowledge upon which the control program was based.

Smith said experience showed that it was no longer profitable to direct case-finding surveys to large, unselected segments of the population. By refined survey activities, significant correlations were found between rates of infection and the usual measures of low social status—poor housing, overcrowding, incomplete education, and low income. Files of reported cases and spot maps pinpoint the problem locally and guide the case-finding team to communities and population segments most likely to be productive.

Blood testing, he said, is an excellent means of finding cases of latent syphilis, but to break the chains of infections the most satisfactory mechanism is interviewing and followup of contacts.

Therapy evaluation is also an integral part of the program, Smith emphasized. Knowledge of the effectiveness of intensive arsenotherapy schedules was the basis for the rapid treatment center program of World War II. These statistical techniques were adapted to the evaluation of penicillin, so that the time-dosage relationship and optimum amounts of penicillin therapy were quickly established. The proved efficacy of the long-acting types, he said, made it possible to return the treatment of syphilis to the outpatient clinic and the private physician.

Thus, statistics are more than a tool or service in a communicable disease program. They are an integral part of program planning, operations, and evaluation.

Mr. Woolsey defined a population survey in health statistics as any technique by which health information is collected from a sample of the population.

Sample surveys, he stated, are suitable for collecting various types of health statistics, such as incidence and prevalence of current illness, particularly chronic diseases; days lost from work; prevalence of impairments, such as blindness and deafness; availability of medical care; coverage of medical care insurance; attitudes; and sanitation, housing, and other environmental aspects.

Such statistics serve many uses in the administration and evaluation of public health programs, for example, in ranking health problems, estimating scope and cost of new programs, and in following cohorts of individuals to evaluate disease prevention and therapy. They are used to estimate needs for medical facilities, for rehabilitation services, and for drug preparations and appliances. Frequently, they suggest hypotheses to be tested by medical research.

Woolsey said the household survey approach has many advantages. Social, economic, and environmental data can be obtained; one can work outward from the interview to the patient's medical records; greater flexibility permits questions to be adapted to current needs.

On the other hand, he noted, household surveys are expensive and require technical skills that are uneconomical for small health departments to maintain on a staff basis.

Blueprints for a continuing national survey to obtain current health information are being prepared by the Public Health Service in the event that such a program is assigned to it.

What WHO Means To Us

By HERMAN E. HILLEBOE, M.D.

THOSE familiar with some of the inner workings of the specialized agencies of the United Nations have come to recognize that the international approach to such problems as health offers the best mechanism for assisting people of all nations to help themselves to a better way of life.

The majority of the member states that have ratified the constitution of the World Health Organization have proclaimed their determination to end isolation in the field of health. No nation has a monopoly on discoveries in the prevention, diagnosis, and treatment of disease. Roentgen of Germany gave us the priceless diagnostic tool, the X-ray, and Einthoven of the Netherlands placed in our hands the electrocardiograph. To the scientists in Britain, we owe the discovery of penicillin; to those in Canada, the discovery of insulin; and to our colleagues in Switzerland, the great weapon against malaria—DDT. In public health, as in no other field of worldwide enterprise, we have true interdependence in the discovery and sharing of knowledge of prevention, diagnosis, and treatment of disease.

Through the years, there have been several international organizations that have contributed to international health, but it was not until the birth of the World Health Organization in 1948 that the pattern was so clearly cut as to what should be done and how to do it.

Dr. Hilleboe is commissioner of the New York State Department of Health and president of the American Public Health Association.

Role of the United States

Some may not be familiar with the details of the United States participation in world health programs. The Public Health Service supplies services to the Public Health Division of the International Cooperation Administration for the recruitment and staffing of overseas missions as well as technical program reviews and professional consultations. The Division of International Health of the Public Health Service is also the center point around which turn the efforts of both multilateral and bilateral health assistance.

The International Cooperation Administration is our official arm for technical assistance. Its programs are under the policy guidance of the Department of State and are now operating in more than 40 countries. As a result of joint conferences on the regional basis between the World Health Organization and the International Cooperation Administration, as well as intracountry planning, many of the programs are being supported by joint effort on the part of WHO and ICA missions. This type of effort has resulted in a sound approach to health problems where the two organizations may supplement each other in their assistance programs.

In 1949 the United States embarked on a program to make the benefits of its scientific advances and industrial progress available for the improvement and growth of less developed

areas. The enterprise—known as point 4—was to be a cooperative one in which nations would work with the United States to improve the human economy. The aim of the program was to help the people of the world, through their own efforts, to produce more food, more clothing, more materials for housing, and more mechanical power to lighten their burdens. Technical assistance, which for decades has been given in a limited manner by American missionaries and private business concerns, was broadened so that a whole nation as a fundamental part of its foreign policy committed itself and its resources to the idea of helping all people to help themselves.

Expanded technical assistance programs have appeared all over the world in specialized agencies such as the newly created United Nations Technical Assistance Administration, the Colombo plan intiated by the British Commonwealth nations, and programs of technical assistance started by France, Switzerland, and Norway. These technical assistance programs have and must include health projects. Health is now recognized as closely associated with any economic and social progress. These programs represent a spirit of international cooperation, a refreshing development in the foreign affairs of benevolent nations. The regionalization project in Puerto Rico is an interesting example of a program with multiple sources of support.

Jonathan B. Bingham, former acting director of the point 4 program, in his recent book, "Shirtsleeve Diplomacy," says: "There are many things that diplomats and money can do but nothing compares to the permanent benefits of sitting down with people and actually doing things that show them beyond the question of a doubt that their health is being improved."

The Voluntary Organizations

In discussing international health we cannot forget the pioneer work of the great foundations in developing health programs. The three United States voluntary organizations most actively operating in the international health field are the Rockefeller, Ford, and Kellogg Foundations. The International Health Commission established by the Rockefeller Foundation in 1913 has carried on its activities successfully in the development of health programs on a cooperative basis. The Kellogg Foundation has done similar work in recent years in the South American Republics, especially in the field of nutrition. These are examples of foundations that have been instrumental in bringing about a modern concept of cooperation in building up within each nation sound and effective programs of disease control and health promotion.

The professional health workers and representatives of the great industries and other leading citizens represented here understand better than most groups the potentialities of the World Health Organization in contributing to world peace. It is the task of the National Citizens Committee for the World Health Organization to bring to the public information on the great potentialities of organizing for world health.

This committee in the United States makes known to our people the importance of good health to the well-being of the Nation. During the last two annual meetings of the American Public Health Association, public sessions were held by the National Citizens Committee for the World Health Organization. Purposeful activities are quickly understood by key citizen groups. With understanding comes acceptance, and with acceptance comes support. This citizens' movement could profitably spread to every nation participating in the activities of the World Health Organization, particularly those nations that have substance to share with less fortunate countries.

Health of One Is Concern of All

There are many of you from other countries who are completely familiar with the important advisory, technical, and research services being performed under the leadership of the World Health Organization. It is significant that the World Health Organization has insisted upon qualified personnel to carry on its activities and that there be a balance of service, training, and research, for it is known that to provide service alone is not sufficient to obtain best results. It is necessary, from the beginning, particularly in less developed countries, to train local people to carry on the new techniques that are being demonstrated. It is equally important to give

the newly trained people an opportunity for exchange of ideas so that they can give the benefit of their experience to their colleagues.

The question has often come up in the United States, sometimes even among health workers, "Why should we support the World Health Organization?" This specific question deserves a specific answer.

As one who first worked with the Expert Committee on Tuberculosis of the Interim Commission of the World Health Organization from 1946–48, I visited many countries of the world, associated with the health leaders of many lands, and participated in some of the field services carried on by Scandinavian teams in their early BCG programs. In recent years, I have observed the work of the World Health Organization in the Far East and in South America. The quality of health leadership provided by the World Health Organization and the importance of demonstration and training when they are used as spearheads to help less developed nations to help themselves continually impress me.

No nation is compelled to support the World Health Organization against its will. No powerful nations are attempting to use influence to force other nations to give financial aid. Everything that is done for WHO is on a voluntary basis. We would not have it any other way.

The world will be strong only in proportion to the strength or weakness of its individual nations. Transportation and communication have changed so much in recent years that no one is now very far away in time from anyone else in the world. Disease can be transported over thousands of miles in a matter of hours. Animal and plant diseases can be carried with ease from one continent to another unless adequate safeguards are set up. Therefore, in the field of health the concern of one nation has now become the concern of all nations. There is nothing controversial about the need for health programs. It is a question of bringing to people the skills and knowledge to carry on preventive services under the leadership of local people.

We must assist WHO with everything that we can spare. We must concentrate attention on major health problems—this will not be difficult because the leaders of WHO have defined them and also have pointed out public health activities that will achieve global results.

The World Health Organization deserves our support because Americans believe in good health for everyone and not for just a chosen few. Good health contributes to a productive life in the community, which in turn gives the individual satisfactions that help him to live in harmony with his fellow man. Health helps to create in man the leadership qualities that are so urgently needed in so many communities today. The physical improvements that come from improved world health are only part of the story. Added improvements, in the form of emotional and mental stability, come with sound physical health.

The program of WHO should be supported because its failure would have a blighting effect upon so many nations. Already the results of joint programs under WHO are measurable in many countries in spite of the modest budget available for a worldwide enterprise. We need to support WHO so that it may keep pace with the other specialized United Nations programs directed toward the improvement of the welfare of people throughout the world. There cannot be social and economic improvement without improvement in health.

Funds spent for WHO are very modest in comparison to funds spent for other United Nations activities, and, in many cases, small in comparison to funds spent for public health in individual countries, and even in some of our States. New York State, for example, in 1955 has a public health budget of $64 million for 16 million people. The World Health Organization budget for 1955 is approximately $9,500,000 for the whole world.

Interchange of Ideas

There are many direct benefits to member nations from WHO programs throughout the six regions of the world. Dr. Boudreau of the Milbank Foundation once said that "better health throughout the world is well worth working for but the experience gained by working together may prove, in the long run, to be of far greater value." This kind of interchange of ideas and this interchange of health

leaders throughout the world is a significant part of the World Health Organization.

In our New York State Health Department, for instance, more than 300 foreign visitors come each year to work with us, to observe, or to exchange greetings. From them we learn as much as we impart.

The professional interchange of ideas is of inestimable value. These scientific workers enter our professional lives and our social lives as well. They observe our culture and our customs; they listen to our music; they enjoy our art and read our contemporary literature. They have a chance to be guests in our homes and see how our families live. These are some of the indirect benefits from training programs on a worldwide basis. On the other hand, we send many American public health workers to foreign countries each year to improve their knowledge in special fields and, in some instances, to impart their special skills to other people who have requested their services. It is clearly evident that one of the great benefits of the World Health Organization, in its 8 years of activity, has been this exchange of scholars and scientists in medicine and public health, to the mutual advantage of all concerned.

In geriatrics and rehabilitation, for example, Scandinavian countries have programs far in advance of anything we are doing on a large scale in America. Physicians in their geriatrics hospitals have answers to many vexing problems confronting us in New York State and in other parts of America. Much more was gleaned from my Scandinavian colleagues on my visit to these countries than they could possibly have learned from me, yet we had the most delightful exchange of ideas and information. Since that visit we have continued to exchange publications and studies of mutual interest. These are the hidden assets of WHO which are of immeasurable benefit and are of a continuing nature.

This spring we had another demonstration of the universality of public health. Shortly after it was announced that the poliomyelitis vaccine trials of 1954 were a success, a mass vaccination program got under way. It started not only in the United States, but also in Canada and Denmark. We hope to learn the answers to many of the epidemiological questions concerning poliomyelitis from our colleagues in those countries.

In 1951, in preparing for civil defense responsibilities, I studied the use of whole blood under conditions of war in Korea. This afforded an opportunity to study the best way to use blood in field hospitals for relatively large numbers of serious injuries—practical knowledge which could be important in times of disaster. Teams of medical workers from many nations were caring for the wounded and teaching each other their native skills as they went about their routine duties. Here was international health in action.

Need BCG Evaluation

On returning from Korea, I stopped at Taipeh, Taiwan, and met a Taiwanian who had worked with me in the Public Health Service during the last war. His tuberculosis control activities in Taiwan, including BCG vaccination and mass X-ray examination, under difficult conditions of limited personnel, supplies, and facilities, obtained measurably good results because of the high quality of his work and his zeal. Again, I learned new methods in handling tuberculosis cases and found out many ways in which this disease affects people differently in different parts of the world.

In the Philippines, on that same trip, we discussed the need for the Tuberculosis Research Office of World Health Organization to collate data on BCG programs and to evaluate their usefulness as public health activities. It was not known how much the tuberculosis mortality and morbidity rates were reduced in whole communities or states by mass BCG vaccination. The lasting effects of BCG vaccine were not known. Since that discussion tens of millions of children have been tuberculin-tested and millions of nonreactors have been vaccinated by World Health Organization teams with the aid of UNICEF funds and supplies. There are some signs that BCG, under certain circumstances, can be useful in tuberculosis control. But we simply have no knowledge or measure of its effectiveness as a means of controlling the disease in a whole community. There remains, then, a great opportunity for WHO to determine, through demographic studies, the relative

value of BCG in the total array of tuberculosis control measures.

Chronic Disease and Disability

There is needed also the same type of definitive studies on the role of new drugs and antibiotics in the prevention and treatment of tuberculosis. Such studies would be most welcome to public health workers all over the world, particularly in those countries where tuberculosis is still rampant.

On a global basis, cardiovascular disease provides a fertile field for epidemiological research that has scarcely been tilled. This research includes the study of the relationship of total fat content of the diet, fat and protein concentration in the blood, the development of atherosclerosis, and the morbidity and mortality from degenerative heart disease. Dr. Ancel Keys has worked with colleagues in England, Scandinavia, Italy, Spain, and Portugal, and, the past winter, among the Bantu in Africa. His intercontinental studies show promise of practical application in preventive medicine. As communicable diseases come under control in many countries and as the proportion of older persons increases with improved public health, the attention of WHO inevitably will be drawn to chronic disease and disability, to which heart disease is a principal contributor.

A survey of patients in the medical wards of several countries is bringing forth some meaningful data, with prevention possibilities, on the cause-and-effect relation of high-fat diets, cholesterol in the blood, and coronary artery disease. The native Bantu gets only 10 percent of his calories from fats and has very little atherosclerosis. The native American gets more than 40 percent of his calories from fats and is greatly affected by atherosclerosis. There are many variables still to be sorted out in this complex relationship, to be sure, but this type of international study in the epidemiology of cardiovascular disease offers hope for new knowledge in the control of a worldwide killer and disabler.

Whether we talk about the control of malaria in India, onchocerciasis in Africa, yaws in Haiti, schistosomiasis in Egypt, yellow fever in the Americas, or heart disease in Britain, we are aiming at the improvement of the health of individuals, improvement of the status of the family, and an improved economic situation for the community.

If manpower is fundamental to all wealth, then this principal can be preserved and augmented by improving the quality of man's health. It is not easy to measure the benefits of public health in money alone nor is it possible for most people to comprehend astronomical monetary figures. Talking about the billions of dollars saved by wiping out malaria among 200 million people baffles the imagination. But when you go into the villages and see the happy families, productive workers, healthy mothers, and clean living quarters, you see values that leave a lasting imprint on your mind.

People need an inner drive to obtain good health for themselves. The leaders in WHO can help to foster that drive among their own people, and they in turn can pass it on to others. This is the kind of contagion that we are in favor of in WHO. This is the kind of service that builds physical and mental and spiritual health; it builds a sense of sharing and of cooperation in common desires that recognize no geographic boundaries. World Health Organization activities admit no barriers of race, creed, color, religion, or economic status. It is a partnership which is expanding and extending throughout the free world. It is a living demonstration to the underprivileged that many of them may improve their standard of life through the channel of better health.

Dr. M. G. Candau, the Director-General of the World Health Organization, last year cited the need for more trained personnel and the importance of environmental sanitation. Significantly, approximately 40 percent of the year's projects in all regions were mainly concerned with education and training. Member nations also were urged to assign high priority to environmental sanitation in all health programs and to make improvement of sanitary conditions a part of most projects, whether for the control of communicable disease or for the improvement of the health of particular population groups, such as mothers and children.

A combination of these vital factors was emphasized at last month's assembly in Mexico

City when the organization agreed in principle to act as a clearinghouse for the international exchange of information on the medical uses of radioactive substances. The WHO long-term program to train adequate technical personnel through fellowship consultants, study teams, and advanced courses in this important new field is reassuring.

The work of WHO reflects an increasing recognition of its real function—that of technical adviser in the development of national health services and of international coordinator of health activities, rather than a source of supplies and equipment and an aid for the temporary alleviation of certain problems.

In these days of speedy transport, we are almost living in each other's backyard. In learning to live so near one another, we have the opportunity and obligation to help improve the health and well-being of our less fortunate neighbors.

We need to endorse healthful living by demonstrating that prevention of disease and disability is a wise investment of national resources. Health is incredibly precious, especially to those who have lost it and then repossess it.

Public health can play a leading role in united efforts to gain worldwide stability; it can do this through the World Health Organization by combating disease, poverty, and ignorance. This is, indeed, a cooperative international enterprise which must succeed. We are determined that it shall succeed, if only for the warmth of satisfaction that it brings to our hearts and for the peace and comfort that it brings to the minds and spirits of men and women in less developed countries of the world.

New York Seminars

Poliomyelitis

Dramatizing the importance of careful control and checking of diagnostic procedures, Dr. Salk, developer of the poliomyelitis vaccine, said he expected more "polio" in the summer of 1955 than ever before, with many ailments erroneously diagnosed as poliomyelitis because of the publicity surrounding the disease.

Dr. Frandsen, in his description of mass vaccinations in Denmark with vaccine prepared in the Danish State Serum Institute according to Salk methods, reported there have been no complications and no cases of poliomyelitis among children vaccinated since April 12. Almost half a million children between ages 7 and 12 (98 percent of the population of that age group) have been inoculated. The Danes are inoculating in the skin rather than in the muscles. The second round began in June. A third shot is scheduled for next year.

Denmark expected to vaccinate the entire population under 40 years of age by the end of the summer. All inoculations are free. The vaccine is paid for by the state and issued to general practitioners. Frandsen expressed Denmark's gratitude to Dr. Salk and others responsible for the vaccine, after describing the severe 1952 and 1953 poliomyelitis epidemics in Denmark.

Dr. Korn's presentation of the factors involved in the evaluation of the 1954 field trials of the Salk vaccine in the United States stressed the voluntary participation in the study of 150,000 workers in 44 States and 211 local areas. Standardization of all procedures, including

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Chairman: Hart E. Van Riper, M.D., medical director of the National Foundation for Infantile Paralysis.

Honorary Chairman: Thomas M. Rivers, M.D., vice president and director, Rockefeller Institute for Medical Research.

Participants: Johannes Frandsen, M.D., director general, National Health Service, Denmark; Robert F. Korns, M.D., deputy director of the Poliomyelitis Vaccine Evaluation Center, Ann Arbor, Mich.; Jonas E. Salk, M.D., research professor of bacteriology, University of Pittsburgh.

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diagnosis and physical therapy, was one of the most difficult aspects of this undertaking. To avoid the presence of diagnostic errors in statistical summaries, diagnosis of poliomyelitis was confirmed when possible by isolation of the virus from the infected person.

Among the interesting factors in the 1954 evaluations was the significantly and progressively greater difference in response to the vaccines by older children. That is, vaccinated 6-year-olds had a poliomyelitis incidence of 40 in 100,000; those of the same age who were not vaccinated had an incidence of 55 in 100,000. At 7, 8, and 9 years of age, the differences between poliomyelitis incidence in the vaccinated and unvaccinated were much greater, with older children benefiting much more from the vaccination. The percentages for all ages indicated an effectiveness of 68 percent against type I poliomyelitis and of 90–100 percent against types II and III. These were the figures used for the final summary.

In reviewing the results of the field trials, Korns said that of the study population, 129 children contracted poliomyelitis. But 88 of that group had received no injection—they were among the controls. Seven had received a powerless injection, or placebo, and 10 had a single inoculation. Of the 34 cases that had some injection, 22 were nonparalytic. The 12 paralytic cases showed no localization in the injected arm as might be expected if the vaccination were the cause. The dates of onset of the disease showed no relation to the time of the injection.

Dr. Salk's detailed discussion of the vaccine itself brought out the fact that natural immunity to poliomyelitis is much higher in poor, undeveloped communities than in those with a higher standard of living. The explanation lies in early exposure to disease because of poor sanitation and similar conditions, with the resulting production of antibodies.

Salk's presentation was aimed first at explaining the principles of producing a noninfectious vaccine and, second, at the immunological principles involved in the use of the vaccine. The virus is inactivated by formaldehyde. Predictable proportions of viruses are inactivated each day, and thus a total virus population in a theoretical batch of 5 million cubic centimeters would be inactivated in, say, 12 days. Since the actual batch is no more than 50,000 cubic centimeters, there is a safety factor of 100. But tests of the vaccine from two different manufacturing laboratories do show differences. These are explainable as slight variations in time or temperature in preparation of the virus—the tiny factors that cannot be entirely controlled.

He described some of the ways in which antibodies are measured with a culture of monkey tissue cells. If monkey kidney cells are healthy and alive, the color in a test tube is changed from red to yellow in several days. In the presence of virus, the cells are destroyed, and the red color is retained.

After preliminary tests, a standard vaccine "A", used as a reference vaccine, was inoculated into children in cubic centimeter amounts of 2, 1, 0.5, 0.25, and 0.0625. The children's antibody response gradually diminished in direct proportion to the amount of vaccine.

With the more potent doses, all responded. At lower amounts not all the children responded after the first inoculation, but after the second shot, they all did.

The third dose, or more, of vaccine within a short time had no effect, even in producing a slight decline in antibodies. Thus, it was decided to space the third shot some months after the first and second for maximum immunity. The body apparently produces a measurable amount of disease-fighting chemical within a few weeks of the first vaccination; the second "shot" gives a measurable kick to the antibody production, and a third one, after antibody production has leveled off into a plateau some months later, provides a second important jump that levels off at that point.

It was found in the course of the study that children with an earlier slight natural immunity (blood samples were taken and level of antibodies determined) received a tremendous boost in antibody level from the first shot. It was also found that the noninfectious vaccina-

tions produce in toto a higher level of antibodies than is reached by a person convalescing from poliomyelitis. A natural infection produces more antibody than the first injection, but with the second and third, the vaccinations are superior to natural infection as immunizing factors.

Antibody persistence was measured in children vaccinated in 1953. The children were given three inoculations a week apart and a fourth 7 months later. Measurement of antibody activity a year later indicated that it maintained a steady high state.

Dr. M. A. Sanchez Vigil, director of the National Institute of Hygiene, Nicaragua, asked the panel if there was any possibility that a virus peculiar to the rhesus monkey, in whose tissues the vaccine culture is grown, could be transmitted to human beings by the vaccine. The answer was "No." The vaccine is tested for the exclusion of other viruses by direct introduction into the brain and tissues of extremely sensitive monkeys; the raw material is tested for disease-producing organisms and excluded if tests are positive; and other tests have shown that formaldehyde destroys other viruses much more quickly than the extremely resistant poliomyelitis virus.

Dr. J. J. Du Pre Le Roux, secretary for health of the Union of South Africa, asked if vaccination could reduce the incidence of natural immunity. The answer to this was "Not likely." Salk thought the duration of virus carriage will be reduced and that better hygiene will also diminish the incidence of virus carriage. Du Pre Le Roux also brought up the question of whether injection of the vaccine would have any effect of sensitizing girls to the Rh factor which produces problems in pregnancy. (The Rh factor is named for the rhesus monkey.) The answer was that in the vaccine filtering process the rhesus antigen is filtered out. Other pertinent data, as yet unreported officially, are the results of experiments on women who have by pregnancy or transfusion been made Rh sensitive. They were injected with the vaccine and showed no reaction to it.

Pandemic Influenza

Influenza differs from other epidemic diseases in that, although mild cases are to be found at all times, there is from time to time a worldwide flareup of a more serious nature. Diphtheria organisms, for example, are consistently present in a given population group, but the influenza virus disappears into a peculiar form of reservoir. Since man is the only host for the virus, the reservoir must be mankind itself.

The spread of influenza poses special problems. The disease would appear to arise at the same time in all parts of the globe for reasons at present unknown, but it has not been proved that influenza does not spread from particular foci. In 1918 and 1919, the disease seemed to appear suddenly for no known reason in many parts of the United States and the rest of the world. However, we are not sure that the influenza virus of that period is the same as the influenza virus types found at present.

After Dr. Horsfall opened a discussion of the potential medical burden of a present-day epidemic of influenza, the panel agreed that currently the total number of influenza cases was not as important as that of other respiratory diseases. When an epidemic, such as the recent outbreak at Fort Dix, N. J., does occur, there is, however, a tremendous burden on medical facilities. The peak of the epidemic at Fort Dix lasted 10 days. There were no fatalities, but 40 percent of the soldiers were hospitalized.

In discussing mutant influenza viruses, Dr.

Chairman: Frank L. Horsfall, M.D., member, Rockefeller Institute for Medical Research.

Participants: John H. Dingle, M.D., professor of preventive medicine, Western Reserve University Schopl of Medicine; George K. Hirst, M.D., chief, division of infectious diseases, Public Health Research Institute of the City of New York; Thomas P. Magill, M.D., professor of bacteriology, State University College of Medicine at New York; and Harry M. Rose, M.D., professor of clinical medicine, Columbia University.

Magill pointed out that there may have been no sudden appearance of new virulent strains because we may have ignored the gradual changes that might have developed in the past. He believes that gradual mutation of the virus is the explanation for the otherwise inexplicable worldwide appearance of a new strain. All influenza viruses are compelled to mutate in the same direction, if they are to survive, because everyone has become immunized to previous strains, in approximately the same degree in comparative age groups.

Virus mutation appears to be continuous, making it hazardous to rely on a vaccine that has been made for longer than a year. Such a vaccine may not immunize because antigenic composition of the virus changes and also because viruses appear with new antigens. However, variations of antigenic composition do not appear to equate directly in terms of virulence of the virus. Antigenic composition and virulence appear to be independent characteristics.

Horsfall summarized the solution to the problem of future pandemics of influenza as lying in two possible methods of control: (*a*) immunizing populations against influenza, or (*b*) eradicating the agent, eradicating the reservoir, eliminating the chain of transmission, changing the host by changing his antibodies.

No presently known chemical substances will eradicate the influenza agent. Eradicating the reservoir is not practical since man is the reservoir. Studies have been made in the chain of transmission. The virus is airborne, and controlled experiments have been made in sterilizing the air by various means, including radiation, but these experiments have yet to show effective results.

Elimination of the chain of transmission means isolation. Altering the resistance of the host seems an attractive solution, but this consideration is still in the theoretical stage. There is no basis for assuming such a solution can be realized in the near future.

The vaccine used for immunological control should include the broadest possible antigenic variation. It is possible to include both A and B prototype strains of influenza virus in an aqueous vaccine, but it is not possible to include more than 3 or 4 variations of the prototype in one aqueous vaccine. While agglutinant vaccines will accommodate a wide antigenic range, because they have a lanolin or mineral oil base, they require an emulsifying agent, which sometimes sets up a systemic or local reaction.

Teaching Public Health

Of basic importance is the philosophy of training medical students in public health practice throughout their medical training and of avoiding the isolation of preventive medicine teaching as a discrete discipline, Dr. Smillie stated. He emphasized that medical school training in public health in the United States is not designed to prepare students to be public health officers. Graduate training in public health administration is offered by schools of public health, he said.

The initial aspect of public health introduced to first-year medical students deals with the statistical interpretation of medical data. This subject is taught through special departments of biostatistics as a separate course. In the second year of medical training, students are introduced to the general field of public health through a course which acquaints them with sanitation, communicable disease control, health education, and other activities. In addition, through the facilities of the New York City Health Department, students at the Cornell University Medical College gain familiarity with the organization of official public health services by means of field visits, inspections of clinics, and observations of environmental control programs.

It is recognized that, in principle, medical students are interested in public health and the other broad aspects of medicine only in their

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Chairman: Wilson G. Smillie, M.D., professor of public health and preventive medicine, Cornell University Medical College.

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first 2 years of training, Smillie commented. He pointed out that it would be fruitless to attempt such broad, theoretical training during the clinical practice years. However, he said, ways have been devised to continue the students' indoctrination and experience with preventive medicine and rehabilitation even during the clinical years. Whereas medical practice and training formerly were based upon two fundamental points, diagnosis and treatment, they have recently evolved into a four-point program, including prevention of disease and rehabilitation as well as diagnosis and treatment.

To integrate preventive medicine and clinical practice during the third year of training, all medical students continue their observations of clinical and home visit activities of city district health offices. In addition, each student who so desires, and Smillie emphasized that nearly everyone does, is made a health adviser to a family selected from the clientele of a teaching hospital that does not have a regular family physician. In this position, the student is responsible, under close supervision, for the total health of his assigned family for 1 year. Although this amounts to a spare-time activity, done mostly during evenings and weekends, the student must make regular visits to the family once every 2 weeks and must be available to them in time of emergency. It is felt that this program is extremely important in giving the student an insight into various ways of life and into the role of environment as it affects the health of people.

The third year field work in health offices and the family health adviser program are well coordinated, since all preventive medical teaching staff members have dual appointments in the New York City Health Department, and each of the eight city health officers is appointed to the teaching staff of the medical college.

In the fourth year of training, Smillie explained, all the departments of the medical schools join together to teach the student comprehensive medical care. In this program each student is responsible, under direction, for the complete care of a number of patients who come to the hospital. Thus, the student begins to consider, for his patients, prevention of disease and rehabilitation following disease, as well as care and treatment during illness.

To explain the rather unique inclusion of rehabilitation in the preventive medical training program, Smillie pointed out that the reestablishment of the crippled child or the patient disabled by an accident to his suitable place in the community was formerly a function of the department of physical medicine. Now felt to be important in the total care of sick people, rehabilitation has been incorporated in all departments of teaching and administratively centered in the department of preventive medicine.

Insectborne Viruses

Man is not an essential host for the maintenance of the insectborne viruses, but it has been shown that antibodies to several viruses are common in the human population, Dr. Theiler asserted. During the years that the Rockefeller Foundation was searching for yellow fever virus in Africa and the Americas, new distinguishable viruses were found, he said. These new viruses were all transmitted by bloodsucking arthropods, and all were maintained in cycles involving the arthropods and the wild animals.

By the systematic use of the hemagglutination inhibition test, two groups of viruses have been distinguished. Group A includes eastern, western, and Venezuelan equine encephalitis,

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Chairman: George K. Strode, M.D., director (retired), international health division, Rockefeller Foundation.

Participants: Max Theiler, L.R.C.P., D.T.M. and H., director, Rockefeller Foundation Virus Laboratories in New York City; Fred L. Soper, M.D., director, Pan American Sanitary Bureau (Regional Office WHO for the Americas); Hilary Koprowski, M.D., assistant director, viral and rickettsial research, Lederle Laboratories Division of American Cyanamid Co., and member, WHO Expert Committee on Rabies Control.

Semliki Forest virus, and Sindbis. Immune serum prepared against any one of these will inhibit agglutination to a high titer with homologous antigen and, to a lesser extent, with an antigen prepared from any other virus of this group. Certain members of group A have a wide distribution. For example, protective antibodies to Semliki virus have been found in populations of Central and South Africa, Malaya, Borneo, and the Amazon Valley.

The second group (group B) is composed of Ilheus, Ntaya, West Nile, Uganda S, Zika, St. Louis encephalitis, Japanese B encephalitis, Murray Valley virus, Russian spring-summer encephalitis, yellow fever, and dengue. These viruses have a worldwide distribution. An immune serum containing antibodies to any one of this group will inhibit hemagglutination of red blood cells by an antigen prepared from other members of this group but not by an antigen prepared from viruses belonging to group A. The immunological overlap in group B is far more marked than in group A.

The hemagglutination inhibition test is group specific not strain specific. The immunological overlaps have theoretical as well as practical implications. Theoretically, it is probable that the immunological overlaps point to a common evolutionary ancestor. Practically, it is conceivable that an individual immune to one member is relatively immune to another member of the same group.

Extensive testing in various parts of the world indicates that many virus infections are common in man. Almost 100 percent of Egyptian adults were found to show antibodies of West Nile virus. A rational explanation of these infections throughout the world is, at present, not possible, Theiler commented.

Aedes aegypti is known by experiment to be able to transmit almost all of these viruses, but only yellow fever and dengue are known to be transmitted by this mosquito in nature. *A. aegypti* is present throughout the tropical and subtropical regions of the world, but it has transmitted yellow fever only in Africa, the Americas, and, in ancient times, southern Europe. Epidemics of dengue, in contrast, have been reported in all tropical and subtropical regions. Recently, in Trinidad, an outbreak of jungle yellow fever among men and monkeys was discovered. Despite *A. aegypti* prevalence throughout the island, no *aegypti*-borne epidemic occurred. Theiler suggested that extensive immunity to dengue prevented the development of an epidemic involving man-*aegypti*-man. The suggestion is based on the immunological relation between yellow fever and dengue. Should this hypothesis be confirmed, it may explain many of the known facts on the distribution of the arthropod-borne virus infections.

Dr. Soper, in discussing the yellow fever threat, asserted that although yellow fever has been virtually eliminated in the United States much of the southern part of the country is considered by the Public Health Service to be receptive to the disease.

Soper illustrated the fluctuations in the incidence of the disease with maps. Brazil had fewer than 10 cases a year from 1946 through 1950, but had 223 cases in 1952 and 39 cases in 1953. Bolivia had 354 cases in 1950, 3 cases in 1951, and 1 case in 1952, but in 1953, there were 18 cases. In many areas of the Americas, there were intervals when yellow fever did not appear at all, he added. In a few areas, yellow fever was known to be present constantly.

A. aegypti is found no longer in Brazil, Paraguay, Bolivia, Peru, and Ecuador. However, northern Argentina, the coasts of Mexico, many Caribbean islands, and areas along the northern shore of South America are still infested.

In the areas where yellow fever is constantly present, the disease is endemic in the monkey population and sporadic in the human population. The disease, from time to time, spreads from its endemic areas in the forest. If the disease spreads to an area infested with *A. aegypti*, an epidemic may follow. The threat of yellow fever is permanent in the Americas so long as there exists an area in which *A. aegypti* is present.

Dr. Koprowski outlined the rabies problem and mentioned the successful efforts in Malaya and Israel to control the disease. In most countries, Koprowski said, the key to the problem is the dog population, although the disease

affects a wide range of animal life. Since the dog lives in close association with man and is especially susceptible to the rabies virus, concerted effort must be directed towards eradicating the disease in the dog population. The newer vaccines can be relied upon for effective control, but the more traditional methods of establishing control of rabies in the dog population should not be neglected.

Mental Health Programs

Team members, introduced by Dr. Levine, demonstrated the team approach to psychiatric orientation in the pediatrics department of New York Hospital-Cornell University Medical College. The team included an occupational therapist, a nursery school supervisor, a child psychiatrist, a person in charge of comprehensive medical care and teaching, a resident in pediatrics, and a child psychologist, among others.

In their discussion of the hospital's teaching program in pediatric rehabilitation, members of the pediatrics department stressed the need for instilling in pediatricians an awareness of the psychological factors in child development. They also emphasized the need for "preventive psychiatry" for the general population. This would necessitate getting to the children early. The hospital's pediatrics division includes opportunities for observing well children in a nursery school, work with sick children and their parents, parent discussion groups led by psychologically oriented pediatricians, a careful followup program for medical students and residents, and extension of the physician into the community beyond his ordinary medical concerns.

In addition, the pediatrics department itself tries to resolve the emotional and psychological problems of the children who are cared for at the hospital. Recognizing, for instance, that a stay in a hospital and illness are traumatic, it has lengthened parental visiting hours to help reassure the child. The new visiting hours—from 10 a.m. to 5 p.m.—are expected to work reasonably well, without interfering with hospital routine.

There are new methods of anesthesia. The basal anesthesia is given in the child's room, and the child's mother is waiting in the room when he awakens after anesthesia. Services of a psychiatric team are available for more intensive work when necessary.

The other two programs discussed were New York State's legislative support of community mental health services and the use of drugs in treating psychotics.

Dr. Lemkau explained the legislative structure of New York's first organized statewide attempt to give public support to psychiatry outside of mental hospitals.

State law provides for: (*a*) education and consultation with social agencies that need and can use psychiatric services in casework; (*b*) promotion of psychiatric outpatient services in hospitals; (*c*) promotion of rehabilitation for persons who have been psychiatrically ill; and (*d*) psychiatric sections in general hospitals. Specifically excluding specialized mental hospitals, the program is aimed at the spread of psychiatric influence and information in general medical practice and in community services.

Although, in effect, the State subsidizes the program, there is no State direction. A board is to be set up in each community for the administration of the law. Problems of the board involve integrating the program with city health centers, cooperation with the schools,

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Chairman: Frank Fremont-Smith, M.D., medical director and executive secretary, Josiah Macy Foundation.

Participants: Henry Brill, M.D., assistant commissioner of the department of mental hygiene, New York State Department of Health; Paul V. Lemkau, M.D., director of the New York City Community Mental Health Board and professor of public health administration, Johns Hopkins University; S. Z. Levine, M.D., professor of pediatrics, Cornell University Medical College.

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and, possibly, the removal of barriers between bureaus in a city.

Dr. Brill discussed the place of drug therapy in mental health programs. The two new drugs, reserpine and thorazine, that are being used for treating extremely disturbed patients have benefited them, he said, "in a way we have never seen before. That, to us, is a miracle."

In hospitals using the drugs, the need for electric shock treatment, physical restraint, and seclusion has to a certain extent been reduced. And more patients have been made accessible to psychotherapy. This has increased the need for psychotherapists.

Reserpine is derived from a plant, rauwolfia serpentina, which has been used in India for more than 100 years for the treatment of mental disorders and hypertension. It has been known in this country for only 2 or 3 years. Chlorpromazine, or thorazine, known in this country only a little over a year, was new in central Europe 2 or 3 years ago.

Brill concluded with the observation that the new drugs have definitely proved that pharmacology has a place in the treatment of mental disorders.

Nutrition

The elements of a nutrition program consist of appraising the diet of the people in an area and formulating steps for improvement if necessary.

Chairman: H. D. Kruse, M.D., Sc.D., executive secretary, Committee on Public Health, New York Academy of Medicine.

Participants: Norman Jolliffe, M.D., director, bureau of nutrition, New York City Department of Health; Charles Glen King, Ph.D., scientific director, the Nutrition Foundation, and professor of chemistry, Columbia University; Herbert Pollack, M.D., Ph.D., associate professor of clinical medicine, New York University.

Appraisal includes clinical examination for deficiency diseases, biochemical examination of blood and urine, and determination of nutritional status by a study of food values for each country, according to a table of values.

To improve nutrition in each country, it is desirable to fit domestic production of needed foodstuffs into a diet and way of life acceptable to local custom and tradition.

People may not know they are suffering from malnutrition, Dr. King said. If Central American children survive the first 5 years—and half do not—they are chronically ill. These survivors have plenty to eat and are not hungry, but they do not realize they are undernourished.

Because weaned infants are fed a diet of corn, in the form of tortillas plus beans and some fresh fruit, they soon show signs of serious protein deficiency. Their total protein intake may be high, because beans are high in protein value, but it is not complete protein or sufficient to develop normal bodies.

Within 6 months, height, weight, and skeletal development show retarded growth. The food intake pattern shows vitamin A and riboflavin deficiencies, confirmed by blood and urine analysis. Iodine deficiency results in a prevalence of goiters.

The United Nations Children's Fund attempted distribution of dry milk powder. Some was sent to the schools; however, it was found that the nutritional damage had occurred before the children entered school.

In evaluating the dietary of a people, the results of the biochemical surveys of the body fluids can be predicted from the clinical symptoms, and vice versa, according to Dr. Jolliffe. The prediction must be confirmed, however.

A clinical examination of 6th grade students in Formosa showed that 78 percent of the children had lesions at the corner of the mouth, known as angular stomatitis. This symptom is an almost sure sign of riboflavin deficiency, particularly when a magenta tongue and lesions around the nose and scrotum are also observed. Urine examination, on the other hand, indicated a riboflavin deficiency in 68 percent of the children. Formosa has a high incidence of anemia,

which sometimes produces similar symptoms, or the percentages might have been even closer.

To determine vitamin C deficiency, physicians look clinically for marginal gingivitis—tenderness and bleeding of the gums—and then biochemically for vitamin C in the blood or urine. According to Jolliffe, when the percentage of marginal gingivitis is found for a study group in western countries, the physician can "hit on the nose" the percentage of vitamin C deficiency found in the urine. A Newfoundland survey showed how this close relationship works: Marginal gingivitis was 38–40 percent; the body chemistry indication was 30–35 percent.

In Formosa 30 percent of the children showed marginal gingivitis, but there was no blood chemistry indication of a vitamin C lack. Actually there was only 1 real case of scurvy in the school population of 1,000 and no scurvy generally in the population.

Getting the dietary status, Dr. Kruse said, can be a crude matter of totaling the amount of food produced and the amount imported, then dividing the total amount by the number of people. Other methods are asking persons to write down what they eat, interviewing individuals about their eating habits, and questioning careful local observers about what people eat.

Local dietaries are sometimes puzzling. Dr. Pollack told of a dietary in Formosa reported to be extremely low in calcium. The average intake was 250 milligrams a day. There were no signs of deficiency although they should have been present. Perhaps the metabolism of the Formosans differs from that of other people, or perhaps there is some unknown calcium in the diet.

By accident, it was found that rice millers in the Far East use a "stone powder," actually chalk or calcium carbonate, to facilitate the flow of rice in the mill, adding it in the amount of 1 percent by weight. Even after washing and cooking, 1 gram of rice contains about 1 milligram of calcium.

Thus, with an ordinary diet of about 500 grams of rice, the calcium intake from rice alone is 500 milligrams. This amount, added to the 250 milligrams from vegetables, makes a respectable 750 milligrams of calcium a day, considered to be adequate for a man 5 feet 3 inches tall, living in a land of intense sunshine.

When the question was raised about milk substitutes in the Far East, where milk production is low and not expected to be adequate for some time, Dr. King said that milk formed an excellent educational nucleus for a nutrition program since it is the most efficient food for children in its content of vitamin A, calcium, riboflavin, and protein.

Much can be accomplished in the next 25 years in countries that seem unable to support livestock, he added. Poultry and cattle can be raised if they are fed silage and legumes. Coconut and soybean "milks" are constructive substitutes in the meantime. Soybean milk, however, has an appetite-depressing effect unless it is fermented or cooked.

The addition of fish to cereals and soups would very readily raise the protein content of the diet. A poultry industry could be built up quickly once the importance of continuous egg and bird production was understood in the far eastern countries where people sell birds for cash. Cottonseed and palm nut presscake would provide good protein supplements to rice and corn diets.

Jolliffe pointed out that, if cattle production were increased in order to increase milk production, land that is now producing directly for food would have to be put into grain production. Far eastern countries could not afford an unfavorable food ratio of production for animal feed, he said.

King replied that modern technology enables more food to be grown on less land, thus making more land available for grazing. Submarginal land could also be used. In one far eastern country, where it was thought that milk production could not be increased, eliminating the nonproductive stock and keeping records on each cow's production in 3 years brought about an increase in average milk production from 1½ pounds per cow per day to 20½ pounds.

Kiyoschi Saito, deputy director of the Institute of Public Health of Japan, said that

Japan tried feeding soybean milk to infants but found that this substitute retarded long-range development even though it seemed adequate for brief periods. Then Japan tried to increase the production of cow's milk because, although 85 percent of the babies are fed at the breast, 15 percent depend on cow's milk. Infant mortality decreased along with the sanitation of cow's milk. In 1954 the rate was 48 deaths per 1,000 births, as compared with 150 deaths 25 years ago. The price of milk has dropped to 20 cents a quart, which is not considered expensive.

The necessity of providing transportation and refrigeration must not be overlooked, Pollack said. Milk production suffers in a country which uses a cow both for carrying and supplying milk. In planning improved agricultural techniques, it is well to remember that when farming is mechanized, fuel is necessary, spare machine parts must be stocked, someone who knows how to fix a machine must be at hand.

When fish farming in ponds in the flooded rice paddies of the Far East was mentioned as another possible way of increasing the protein in the dietary, Pollack doubted the value of such a practice, saying that the nitrogen needed by the fish would not be replaced in the soil.

Dr. Roberto Munoz Urrutia of Chile mentioned that 20 years ago a Chilean consumed about 50 liters (about 50 quarts) of milk a year. Now the amount is about 102 liters. In 5 years the average Chilean is expected to be drinking about 150 liters a year.

There has been no improvement in transportation, in refrigeration, or in number of cattle in Chile. Instead, people are drinking the milk that formerly was wasted and using dry milk and dried skim milk. These changes are the result of consumer, producer, and government education. Once the problem was understood, it was easy to solve.

Chile is now working on introducing more fish into the diet to give the people more protein. Pilot experiments with an odorless, tasteless fish flour showed that children like and tolerate a bread flour containing a 10 percent fish flour (presently imported from South Africa), yet do not know they are eating fish in bread.

Tuberculosis Control

New types of chemotherapy have brought about a decrease in the death rate from tuberculosis, according to Professor Amberson. Now only 1 death is reported annually for each 5 or 6 new active cases, whereas formerly the mortality was 1 death for each 2 new active cases. In some areas, the panel reported, tuberculosis was disappearing completely in children and young adults.

Among the new drugs under study for the treatment of tuberculosis is pyrazinamide, which has been actively investigated by Dr. McDermott and his associates, Dr. Chaves told the delegates. Pyrazinamide is one of several chemical substances capable of modifying the course of tuberculosis. The drug at first appeared to be ideally suited for widespread use, but, unfortunately, it has proved to be too toxic to be used generally or indiscriminately.

Whether pyrazinamide can be successfully modified is still a question. Nevertheless, the demonstration in animals, by a laborious but precise technique which shows that it is possible to eradicate tuberculosis infection by this method, represents an unprecedented achievement.

Other drugs, such as isoniazid, are being used

Chairman: Walsh McDermott, M.D., professor-elect of public health and preventive medicine, Cornell University Medical College.

Participants: J. Burns Amberson, M.D., professor of medicine, Columbia University College of Physicians and Surgeons; Aaron D. Chaves, M.D., assistant professor of clinical public health and preventive medicine, Cornell University Medical College, and supervisor of clinic, bureau of tuberculosis, Department of Health, New York City; Carl Muschenheim, M.D., associate professor of clinical medicine, Cornell University Medical College.

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today to treat tuberculosis. Replying to McDermott's question as to what forms of pulmonary tuberculosis should be treated with drug therapy, Amberson said that today there is a tendency to treat all tuberculosis with chemotherapy. However, he pointed out, drug therapy should be delayed until a complete diagnosis is available. The objection to immediate drug therapy is that the patient may be committed to a regime of treatment before a diagnosis of active tuberculosis is established; hence, before therapy is begun, one must be sure that active lesions are present. If the lesions are old scars, chemotherapy is not needed.

McDermott said that isoniazid could not be considered as a tuberculosis vaccine. However, Amberson pointed out, many patients are responding completely to chemotherapy and bed rest. Patients with lung cavities of from 3 to 4 centimeters may show no further improvement, and for such patients it would be necessary to consider lung collapse or surgery.

Blood and Tissue Banks

The possibility of transmitting the virus of infectious hepatitis in whole blood transfusions or in fibrinogen is a blood bank's most serious problem today, according to Dr. Kellner. Blood is never knowingly accepted from donors who have had the disease, since virus may still be present, he specified.

The greatest danger, Kellner said, is in the transfusion of whole blood. He indicated that he would chance the risk of hepatitis virus in the fibrinogen fraction (sometimes used to help coagulate the blood in cases of hemorrhaging after childbirth or after lung or liver operations) if someone were bleeding to death. Attempts have been made to sterilize fibrinogen and some is now virus free, he noted.

In answer to a question about the use of blood transfusions for leukemia patients, Kellner reported that many leukemia patients are kept alive with transfusions, although blood is no cure for leukemia. Some children with leukemia are kept alive for 10 to 15 years by blood transfusions every 2 or 3 weeks, he said.

Asked if fibrinogen would help to coagulate the blood of hemophiliacs, Kellner replied in the negative, adding that hemophiliacs lack prothrombin, another important element in coagulation which acts on the fibrinogen to form fibrin.

Concerning the possibility of using animal blood, Kellner indicated that he did not expect ever to use whole blood from animals. During the war, an attempt was made to use one fraction—the albumin of cow's blood—but even this evoked serious sensitivities, and it was discontinued, he reported.

An eye bank's greatest problem is in getting a sufficient number of eyes, according to Dr. Troutman. The eye bank at Manhattan Eye and Ear Hospital in New York receives only 30 to 40 eyes a week, and there is always a waiting list of about 500 people, he reported. Throughout the country, there are an estimated 10,000 to 20,000 persons who would benefit from corneal transplants.

Troutman explained that in addition to permission for an autopsy, the law requires that a donor separately will his eyes to a bank. It is sometimes felt that donating the eyes may interfere with the autopsy permission, he said.

In obtaining an eye, which is done within 3 hours of the donor's death, complete surgical procedures are used for sterilizing the tissues. The eye is taken out whole and placed in a sterile bottle on a moist ring of cotton. It is then refrigerated at just above freezing (32°–45° F.) until the corneal graft is made. The eye must be used within 3 days.

Sometimes eyes are received at the eye bank floating in a solution, Troutman remarked. These, he said, are not usable.

Chairman: Aaron Kellner, M.D., director of laboratories, New York Hospital.

Participants: Edward B. C. Keefer, M.D., instructor in surgery, Cornell University Medical College; Richard C. Troutman, M.D., assistant professor of clinical surgery in ophthalmology, Cornell University Medical College.

He pointed out that no attempt is made to sterilize the eye because of the thickness of the tissues. But even so, there is a very low incidence of infection, and the infection that does occur is usually attributable to stitch abscesses and has nothing to do with the eye itself.

New techniques are being used in making the grafts with a split thickness of cornea, he said. This makes the operation promising in cases where formerly it was not. Troutman mentioned as another technique under investigation quick freezing of the cornea alone, which would enable it to be kept longer. After being treated with glycerol, the cornea is quick frozen, held at a temperature of −79° C., and thawed just before use.

Asked if the eyes of newborn babies are ever used, Troutman said they are, even those of stillborn babies, although the eye bank prefers those of fetuses that are at least full term. Eyes are usable as long as the cornea is clear, and there is no relationship between the age of the donor and the clarity of the cornea, he said. Statistically, however, there is some evidence that the transplant is better when the eyes are a bit older, he added.

The eye bank at the Manhattan Eye and Ear Hospital, which was established in 1945, is a nonprofit private enterprise. Donors are not paid for their eyes, and they are given to patients at no cost. Transportation for them to and from the main bank and the branch banks is furnished free by the Red Cross and the airlines. The bank is national and also handles some overseas distribution on a rotational and emergency basis.

Blood vessel banks, and more specifically banks for storage of the largest artery in the body, the aorta, were discussed by Dr. Keefer. He listed three ways of preserving arteries: by refrigeration, which permits them to be kept for 6 weeks; by freezing, which enables them to be kept for a year (at −70° to −80° C.) in dry ice; and by freeze-drying under vacuum, which enables them to be kept indefinitely. Arteries to be preserved by the latter method are sterilized by ethylene oxide, high-intensity electron beams, or beta-propriolactone.

Control of Cancer

Memorial Center for Cancer and Allied Diseases—the first institution of its kind in the United States—is extending its efforts toward improving the rate of cure of cancer and toward defining and eliminating the causes of the disease. Sloan-Kettering Institute is the research subdivision of Memorial Center.

Curing cancer involves the search for a better means of curing local cancer and for techniques which, it is hoped, will come from future research for curing disseminated cancers. Curing local cancer involves early diagnosis and extirpative measures currently employed, such as surgery and radiation.

Despite the massive effort to educate the public, improve cancer detection methods, and treat early cancers, the resulting decrease in the death rate is almost wiped out by the continuing increase in the rate of respiratory cancers, Dr. Rhoads pointed out.

At Sloan-Kettering Institute, Rhoads said, an effort has been made to regard and handle cancer cells according to the Henle-Koch postulates for the presence of infectious agents; that is, (*a*) to detect the presence of the organism in affected tissue, (*b*) to cultivate the organism successfully in a culture medium, (*c*) to induce the disease by inoculation of an organism with the culture, and (*d*) to induce an acquired resistance to the disease.

Cancer cells conform to the Henle-Koch postulates in that the cells are identifiable in human tissue. They can be grown in a test tube in which the colonies show forms similar to

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Chairman: C. P. Rhoads, M.D., scientific director, Memorial Center for Cancer and Allied Diseases, and director, Sloan-Kettering Institute.

Participants: Emerson Day, M.D., director, Strang Cancer Prevention Clinic, and chief, division of preventive medicine, Sloan-Kettering Institute; Leopold G. Koss, M.D., director of cytology, Strang Cancer Prevention Clinic; Brewster Miller, M.D., director, professional education, American Cancer Society.

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those of other cultures, and they can also be grown in eggs.

A culture can be implanted in the membrane of a chick embryo. The hatched chick will bear disseminated cancer nodules. These chicks are sent to other laboratories for biological and chemotherapeutic study.

Cancer may be induced in both animals and human beings by back inoculation with the test tube culture. The culture grown in the test tube shows the morphology of the original tissue long after the death of the person from whom the tissue was removed.

Sloan-Kettering harvests weekly about 3½ pounds of different types of cancer tissue from animals in which cancer has been induced. Implants are sent for confirmation to other laboratories.

The work at Sloan-Kettering and similar investigations have led Rhoads and others to believe that it is proper and profitable to seek control of disseminated cancers by chemotherapy. Selective destruction of cancer cells in animals has already been achieved by chemical methods at Memorial Center, but a chemical method for completely destroying cancer cells in man is still to be found.

In describing the work of the American Cancer Society, started in 1913 and now represented in all States and in Alaska, Dr. Miller first presented statistics on the incidence of cancer and then described the society's fund-raising methods, allocation of funds, sponsorship of research, and methods of education.

Public education methods include advertising the "seven danger signals," publication of informative literature, maintenance of information centers, use of radio and television, production of a film on breast self-examination, and considerable professional educational material.

On examining the society's material for the public, diplomates of the American Board of Psychiatry expressed these opinions: 11 percent disapproved, 7 percent saw some harm in the material but had no opinion as to whether the harm outweighed the good, 16 percent felt the material was harmful to some extent but thought the good outweighed the harm, 43 percent thought the material was good. Twenty-one percent expressed no opinion.

Dr. Day is convinced that worldwide statistical surveys and other studies may produce clues to the prevention of cancer. The Strang Cancer Prevention Clinic, which is aimed at presymptomatic detection of cancer, receives about 40,000 annual visits from some 22,000 persons, he reported. The clinic's record of proved diagnoses varies with the ease of accessibility of the cancer site.

At the clinic the examining physician is expected to record a complete history and perform a systematic physical examination. Proctosigmoidoscopy, by which tissues in the rectum and colon are made visible, is a particularly successful technique, and, although now used for all persons over 45 on a return visit, Day believes it should be part of the basic examination pattern for everyone, at least once. Basic examination includes laboratory examinations of blood and urine and X-rays of the chest.

Cytological examination of a smear taken from female genitals is the closest to a successful detection method so far developed. Two-thirds of all the detection of cancer of the female genitals made at the Strang clinic is solely from microscopic examination of the cells aspirated or swabbed from the cervix and vagina. There were no other leads to such diagnosis.

Dr. Koss, whose speciality is microscopic study of cancer cells, described the principles behind the Papanicolaou smear test. Any growing surface tissue (epithelial tissue) has a constant turnover of cells—new cells replace the cells that are shed. Cancer cells are shed much faster than the cells of normal tissue, are not as adhesive as the cells of normal tissue and are much more easily removed, and have a tendency to accumulate in a body "receptacle" from which they can be collected. In lung cancer, the cells accumulate in the lumen of a bronchus. When the person coughs, the cells are brought up to a point where they can be collected. When the uterus is cancerous, the cells collect in the vagina.

Papanicolaou's enunciation of technical standards for the preparation and interpreta-

tion of the morphology of cancer cells and his directing of attention to organs that were not being explored by existing diagnostic means represent a great step forward in cancer detection. Extensive experience and training are needed, however, to handle cytology successfully, Koss pointed out.

Next to cancer of the breast, cancer of the cervix is the most common type of cancer in women. In a few decades no woman should die from this form of the disease, Koss believes. It is now recognized that early cervical cancer is a surface phenomenon; at this stage it does not penetrate the underlying tissue and is 100 percent curable. The cells behave like those of invasive cancer and are easily recognized by cytological examination.

A recent development in cancer cytology is the promise of a machine to screen cell and nucleus diameters mechanically rather than have them examined in the tedious way now employed. Such a machine is currently being tested.

National Pharmacopoeias

The importance of an international pharmacopoeia which lists standards for approved prescription drugs and their indicated usages was the theme of this session.

Dr. Cook gave a brief history of the development of this essential element in world health progress. Discussion started in Europe more than 100 years ago and led to the formation of the International Pharmaceutical Congress. The congress met in Chicago in 1893 and resolved to develop an international pharmacopoeia. The problem was again considered by the League of Nations, but the work was interrupted by World War II. After the war, when the United Nations was created, one of the first steps taken by the World Health Organization was the reorganization of the pharmacopoeia program.

In 1951 the first volume of the First International Pharmacopoeia was published. It provides standards for about 200 basic drugs, but only a few preparations. Volume II is now in preparation.

Dr. Miller pointed out that fewer than 20 countries today have pharmacopoeias of their own. He said this means that many countries do not have legal standards of purity for drugs, and added, "These countries are in a delicate position because they must import drugs on faith. The International Pharmacopoeia therefore should become a major contribution to public health."

It was pointed out that many of the countries which do not have a national pharmacopoeia use one of those developed by some other nation. However, Dr. Brady documented from his own experience the difficulty of practicing medicine and prescribing drugs in areas where there is no official publication.

Dr. Taylor described the work of the Combined Pharmaceutical Contact Committee of which he is chairman. This group assists in the preparation of the United States Pharmacopeia by making recommendations for establishing standards and then, on a voluntary basis, conducting the research necessary to set such standards. Although the committee has no official status, its recommendations are usually accepted. Taylor said that he described this methodology in detail because it worked so well in the United States, and other nations might want to adopt it in preparing pharmacopoeias of their own.

Cook outlined the system used in the compilation of the International Pharmacopoeia. A

Chairman: Lloyd C. Miller, Ph.D., director of pharmacopeial revision, United States Pharmacopeia.

Participants: Frederick J. Brady, M.D., assistant chief, Division of International Health, Public Health Service; E. Fullerton Cook, D.Sc., chairman (retired), Committee of Revision, United States Pharmacopeia, and former member, WHO Expert Committee on the International Pharmacopoeia; Frank O. Taylor, D.Sc., chairman, Combined Pharmaceutical Contact Committee of American Drug and American Pharmaceutical Manufacturers Associations, and member, Committee of Revision, United States Pharmacopeia.

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tentative text was drawn up by an Expert Committee on Unification of Pharmacopoeias and the permanent Secretariat on Pharmacopoeias of WHO.

The tentative text was carefully revised by members of the committee with the help of specialists. All suggestions and criticisms were referred to Geneva and published in the official WHO circulars. These were then considered at the next meeting of the committee.

The galleys and page proofs of both volumes I and II were similarly handled by the committee and, in addition, the page proof of volume II was sent to the governments of all 85 member nations, inviting criticisms, comments, and suggestions. Cook added that if this policy is continued during the present revision of the First International Pharmacopoeia, the second edition would truly represent world judgment and justify the adoption of its standards in many national pharmacopoeias.

English, French, and Spanish editions of the International Pharmacopoeia are to be issued by WHO, with the hope that its sales will eventually cover its cost. WHO has also authorized translations by other nations, but only under WHO supervision; a German edition of volume I will soon appear. The Spanish edition of volume I is also promised soon. As the WHO program developed, the earlier committee of 7 pharmacopoeial experts was expanded, and an advisory panel of at least 30 specialists from 17 countries was appointed. These are experts in particular subjects and contribute information by correspondence or by attendance at sessions of the main committee.

The preparation of texts for the International Pharmacopoeia, however, is not limited to contributions from these appointees. Assistance and advice come from many other sources including the International Union of Pure and Applied Chemistry, the International Organization for Standardization, the World Medical Association, the International Pharmaceutical Federation, and from divisions of WHO, such as the groups studying malaria, tuberculosis, venereal diseases, plague, and so forth. Also a large number of other specialists located in strategic points throughout the world contribute. The details of some tests for identity and purity or some assays, as incorporated in various national pharmacopoeias, may differ in minor details to meet different conditions, but the maintenance of equal quality, purity, and strength for essential drugs is the primary objective of the International Pharmacopoeia.

Administration Techniques

Public health administration in the United States is "a happy marriage of voluntary citizen groups, other community groups, and official health agencies," Dr. Baumgartner pointed out. Public health programs are either aided or made possible by citizen and industrial groups. In New York City, where adequate government inspection of restaurants and eating places is impractical, programs of self-inspection for poor sanitary practices by restaurant operators, schools in the fundamentals of sanitation for management and employees, and employment of trained sanitary inspectors by chains and large restaurants have combined to assure clean, sanitary eating places with minimum official health activity.

In discussing attitudes of citizens toward public health, Dr. Baehr said that support of voluntary health organizations stems from the rugged pioneering development of this country. The first villages and settlements found it necessary to plan sanitary and disease

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Chairman: George Baehr, M.D., president, Health Insurance Plan of New York.

Participants: Leona Baumgartner, M.D., commissioner of health, New York City; Herman E. Hilleboe, M.D., commissioner of health, New York State; E. Gurney Clark, M.D., professor of epidemiology, Columbia University; Nathaniel H. Cooper, M.D., director of health and welfare, Health Council, New York City; William C. Spring, Jr., M.D., professor of public health administration, Johns Hopkins University.

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control measures cooperatively. Even after government assumed much of this responsibility, people expressed interest in their health by forming voluntary organizations to solve specific health problems. Baehr emphasized that "this peculiar American pattern of citizen participation and understanding underlies the great development of public health in this country" and that without it, the great forward strides which have been made would never have been possible. He cited, as an example, the role of the National Foundation for Infantile Paralysis in the development of the Salk poliomyelitis vaccine.

Dr. Hilleboe stressed two other types of public health administration carried on in the United States—relationships with State and local medical societies and interlocking directorates in health programs. Hilleboe cited two requisites for successful cooperation, that medical societies are not offended by either official or voluntary health groups and that all groups are talking about the same thing.

In the New York State Health Department's bureau of cancer control, the director serves as chairman of the voluntary cancer society. Thus, one individual can participate in planning, securing funds, program operation, and program evaluation. The State health commissioner meets with the executive committee of the State tuberculosis commission, 80 percent of which is nonprofessional, and assures cooperative planning, action, and policy. Hilleboe emphasized the two-way nature of such cooperation by explaining the practice of establishing special committees for the State health department, drawing upon voluntary group representatives on the committees for local thinking and expression.

Hilleboe outlined the State's responsibility in synchronizing its program with national and Federal programs and at the same time in assuring that city and county health programs are in tune with State plans. He stressed that poliomyelitis control involves problems other than vaccination, in particular, hospital treatment and care of chronically ill patients. Hilleboe outlined the procedure for the care of poliomyelitis patients, wherein the first 30 days of hospital care are subsidized by the National Foundation for Infantile Paralysis and all care after that by New York State in its State Hospital for Crippled Children or, on a 50-50 matching basis, by local government in other hospitals.

Dr. Clark described the principal problems in venereal disease control. By 1953, after major accomplishments in control of venereal diseases, appropriations for the control program were drastically decreased. The resources of the American Social Hygiene Association and the American Venereal Disease Association were combined with those of the Association of State and Territorial Health Officers to take new bearings. Their surveys showed that, in the last half of 1954, 43 States experienced an increase in venereal disease, two-thirds of the States could not find ways of compensating for decreased Federal funds, and one-third had inadequate treatment facilities. This information resulted, Clark pointed out, in recent increases in Federal grants to States for the control of venereal disease, as well as in a better-informed public.

Dr. Cooper discussed overlapping, duplication, and failure to fill important gaps in health services resulting from the growth of voluntary agencies working in the same fields. He described the development of community and State health councils as a means of coordinating the programs of all citizen groups working toward better health.

Dr. Spring asked for caution in using statistics which tend to lead the public to believe that all disease and sanitary problems are solved or nearly solved. He stressed the work still to be done and urged that health workers demand continuing opportunities for disease control even in the light of greatly reduced disease incidence. Clark emphasized this point by citing the near-epidemic proportions of venereal disease in some towns and cities, although the general rate has dropped appreciably. In New York City venereal disease rates in some neighborhoods are higher than the rate for the city as a whole.

Clark pointed out the problems in areas where there is a desire for home rule and a reluctance

to lose local autonomy by turning health protection over to more distant governmental groups. In these cases, programs seemed to be leading toward health units composed of governmental health services voluntarily financed. Where home rule localities are not large enough to furnish tax money for adequate health service, a potential exists in voluntary fund raising and voluntary financial support for otherwise official government health programs.

Baehr emphasized that the most significant value of voluntary agencies lies in the participation and understanding of citizens, which have been responsible for the development and security of the official public health services in this country.

Several speakers noted the increasing importance of international efforts. The work of the International Union Against Venereal Disease in the exchange of information is an example of international cooperation. Baehr pointed out that voluntary citizen groups, such as the United States National Citizens Committee for the World Health Organization, although constituted in one country, work toward better health for the world as well as for the Nation.

Rehabilitation Services

The present concept of rehabilitation evolved at the end of World War II, when it became apparent that the previous definition of adequate surgical and medical care for the badly injured was not complete, according to Dr. Rusk.

It was determined that a man should not be discharged from medical care until he had reached the peak of his latent capacity, he said. It was discovered that this capacity should be determined with reference to both the man's disabilities and his capabilities.

The need for rehabilitation after World War II was dramatically demonstrated, he noted, by the fact that there were more than 2,500 paraplegics, over 2,000 more than after World War I. However, because of improvement in therapy, more than 1,760 of the paraplegics from the Second World War are now living, whereas only 2 of the First World War cases survived for a comparable period of time. Moreover, of the World War II cases, more than 1,200 are no longer in bed but have returned to civilian life.

Emphasizing the international aspect of the program of the Institute of Physical Medicine and Rehabilitation, Rusk pointed out that in rehabilitation there is an international language in which all can work out a program together. As many physicians from other countries are involved in the institute's program as are medical men from the United States, he remarked.

The institute no longer calls its work rehabilitation but considers it the third phase of medical care—the program that takes the patient from bed to a job, Rusk noted. This work is such that it must be done by a team. It involves an understanding not only of the medical diagnosis of each case but also of the patient's emotional problems.

When a patient comes to the institute, his medical diagnosis is reviewed by the team. Then the patient receives a psychological examination, and his case is reviewed by social workers.

Dr. Deaver described a series of tests he has devised called the Needs of Daily Living. Each patient is studied and graded on the basis of these tests, he said. The patient then comes before the staff of the institute and a training plan is outlined. Prosthetic and other devices

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Chairman: Howard A. Rusk, M.D., director, Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, and professor of physical medicine and rehabilitation, College of Medicine, New York University.

Participants: Donald Cobalt, Ph.D., assistant director, Institute of Physical Medicine and Rehabilitation; George Deaver, M.D., in charge of the children's division, Institute of Physical Medicine and Rehabilitation.

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are considered, and the possible development of the patient's capabilities is anticipated.

The institute designs many of its own prosthetic devices, some of them of an unusual nature. For example, for a man who had lost flexion of his fingers, a device consisting of straps of woven glass cloth impregnated with resin was designed. It fits over the back of his hand and over three fingers, permitting him to hold a pencil or a spoon or fork.

Dr. Cobalt pointed out that a wheelchair should be prescribed for a disabled or paraplegic patient just as carefully as a drug. The wheelchair should be planned to enable the patient to help himself to the greatest extent possible. One patient, a poliomyelitis victim, is now able not only to adjust his prosthetic devices without aid, but also to handle his demountable wheelchair. He can wheel himself to his car, get into the driver's seat, fold his chair, and bring it into the car after him.

In enabling people to live and work with what might seem to be insurmountable incapacity, the staff of the institute has the aid of nature itself, Rusk emphasized. Nature offers a tremendous overcompensation for physical defects as is shown by the blind, whose senses of smell and touch are greatly developed. Moreover, the conditions of civilization today are such that the average person needs to use only approximately 25 percent of his physical capacity, Rusk noted.

At the session, a number of current and former patients of the institute demonstrated their ability to handle prosthetic devices or to compensate otherwise for their disability. One was a 5-year-old boy recently arrived from La Paz, Bolivia, whose hands and feet are attached directly to the trunk of his body. A handsome, alert youngster, he has learned to move about by rolling like a tumbleweed, a technique that he happily demonstrated for the delegates to the World Health Organization. The institute is now developing devices whereby he will be able to walk upright, and other devices whereby he will be able to live normally.

Rusk asked the Vice President of Bolivia to consider the payment of a big fee for the institute's care of the boy: the establishment of rehabilitation centers in Bolivia where handicapped children can be retrained. The Vice President replied, "We will pay the fee."

Pharmaceutical Production

Pharmaceuticals are only as good and as safe as the quality controls used in their manufacture, Dr. Brady said in pointing out that such controls account for 10 to 15 percent of production costs for pharmaceuticals in this country.

The application of the controls and the techniques used in the production of antibiotics were observed by the visitors during a tour of the Pfizer laboratories prior to this session. Fully described during the laboratory and process demonstrations were all the steps in the development and production of an antibiotic, from the search for, and isolation of, promising micro-organisms used to produce these drugs, through the packaging of final products.

During the discussion, Dr. Weber pointed out that three factors influence quality and quantity in the production of antibiotics: the particular strain of micro-organism used; the type of nutrient medium; and the type of equipment used in the fermentation and concentration processes. Pharmaceutical manufacturers producing antibiotics are constantly working toward improvement in all these factors. Essentially, Weber added, antibiotics must be toxic to disease organisms, nontoxic and well tolerated by humans, and not too difficult to produce.

Gaunt expressed the hope that antibiotics that will be effective against virus infections

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Chairman: Frederick J. Brady, M.D., assistant chief, Division of International Health, Public Health Service.

Participants: W. E. Gaunt, Ph.D., director of quality control, E. R. Equibb & Sons division of Olin Mathieson Chemical Corporation; W. Brooks Fortune, Ph.D., director, control division, Eli Lilly & Co.; E. M. Weber, Ph.D., director of biochemical research, Chas. Pfizer & Co., Inc.

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and bacteria now resistant to known drugs will be found soon. Special research leading to these goals is in progress and is also part of the screening program for all new antibiotics.

The question of whether a specific country should build production facilities for the manufacture of pharmaceuticals or import them depends not alone on building factories but also on the availability of raw materials, transportation, highly skilled personnel, and a potential market of sufficient size to support large-scale mass production which will make possible a low price that the public can afford. The speakers pointed out that the high standards of pharmaceutical production in the United States depends on a successful balancing of these factors together with cooperation between manufacturers and governmental organizations.

Guests at Post-Assembly Technical Sessions

Dr. Abdul Zahir, *Afghanistan;* Dr. G. M. Redshaw, *Australia;* Dr. Josef Gratzer, *Austria;* Dr. P. Van de Calseyde, *Belgium;* Dr. Hernan V. Del Carpio, *Bolivia;* Dr. Raymundo A. Moniz de Aragao and Dr. Orlando Fontes, *Brazil;* Dr. Nealsmoeuk and Mrs. Nealsmoeuk, *Cambodia;* Urban Nelson, *Canada;* Dr. Don Lionel Joannes Kahawita; *Ceylon.*

Dr. Roberto Munoz Urrutia, Mrs. Roberto Munoz Urrutia, and Dr. Alfredo Riquelme, *Chile;* Dr. Johannes Frandsen, Dr. Oluf Andersen, and Dr. Bendt Sorensen, *Denmark;* Dr. Frederico Alvear-Perez, *Ecuador;* Dr. M. H. Aboul Ela, Dr. El Demerdache Ahmed, Dr. Mohamed Othman Shoib, Dr. Fathi A. Soliman, Dr. Nour El Dine Tarraf, and Dr. Hassan Saad Yusef, *Egypt.*

Dr. Richard E. Trail, *England;* Maurice B. Sedeuilh, *France;* Dr. Otto Buurman, Dr. Otto Olsen, Dr. Fritz Bernhardt, and Prof. E. G. Nauck, *Germany;* Dr. Athanase Mantellos, *Greece;* Dr. Julius Sigurjonsson, *Iceland;* Lt. Col. C. K. Lakshmanan, Mrs. C. K. Lakshmanan, Dr. B. B. Dikshit, Dr. Vasant N. Panse, Mrs. Vasant N. Panse, Dr. Tara Chatterjee, Dr. Ganesh des Gothi, Dr. Balwant Singh Kohli, Dr. K. S. Ajit Prasad, and V. K. B. Pillai, *India.*

Dr. R. Mochtar, R. Tulay Waworuntu, Dr. Willy Hadisumarto, and Dr. Raden Roekmono, *Indonesia;* Dr. A. T. Diba, Dr. J. S. Saleh, Mohammad M. Goodarzi, and Dr. N. Ambarsumian-Melik Hacobian, *Iran;* Dr. Simon Btesh, Dr. Shabbetai Ginton, and Zeev Schor, *Israel;* Prof. Giovanni A. Canaperia, Dr. Raffaele Vannugli, and Dr. Maurizio M. Formica, *Italy;* Dr. Kiyoschi Saito and Dr. Kohei Toyokawa, *Japan;* Dr. Subhi Amin, *Jordan.*

Dr. Haing-in Paik, Dr. Chai Ho Ahn, Dr. Sook Bang, Dr. Nae Kwan Chsung, Dr. Chung Bin Chu, Dr. Hwa Young Chun, Dr. Chang Shin Kim, Dr. Do Yun Kim, Dr. Hyung Rin Kim, Dr. Pyung Ki Kim, Dr. Kook Hoon Ko, Dr. Myung Soo Lee, Dr. Pong Shik Lee, Dr. Samuel Y. Lee, Dr. Seung Hoon Lee, Dr. Myoung Sun Moon, Dr. Soo Hyun Pai, Dr. Lee Gap Park, Dr. Myung Jin Park, Dr. Gyung Byung Roh, Dr. Hyun Jin Roh, Dr. Pil Soo Shin, Dr. Sun K. Song, and Dr. Kang No. Yoon, *Korea.*

Dr. Yousef Bauji, Mrs. Yousef Bauji, and Dr. S. Hayek, *Lebanon;* Fathi Abidia, Dr. Clement Noger, and Mrs. Clement Noger, *Libya;* Dr. Luis Cantellano, *Mexico;* Dr. Etienne Boeri and Mrs. Etienne Boeri, *Monaco;* Dr. Abdelmalek Faraj, *Morocco;* Dr. C. Van Den Berg, Prof. H. W. Julius, and Dr. N. A. Roozendaal, *Netherlands.*

Dr. M. A. Sanchez Vigil and Dr. Roberto Castillo, *Nicaragua;* Dr. Frederik Mellbye and Dr. Bard J. Brekke, *Norway;* Lt. Col. M. Jafar, *Pakistan;* Dr. Nicanor Carmona and Dr. G. Manuel Luna, *Peru;* Dr. Rafael Tumbokon, Mrs. Rafael Tumbokon, Dr. A. C. Regala, Dr. Gabino Balbin, and Dr. Josefina A. Nava, *Philippines;* Dr. Augusto de Silva Travassos, Mrs. A. de Silva Travassos, and Dr. Antonio de Carvalho Dias, *Portugal.*

Dr. D. Gerardo Clavero, Dr. Florencio Perez Gallardo, and Dr. Julio Bravo Sanfeliu, *Spain;* Dr. Ahmed Ali Zaki, *Sudan;* Dr. A. G. W. Engel, Dr. S. O. af Geijerstam, Dr. M. P. V. Tottie, and Dr. Bertil Roos, *Sweden;* Dr. R. Tarazi, Mrs. R. Tarazi, and Dr. Dia E. El-Chatti, *Syria;* Dr. J. Heng Liu and Dr. T. C. Kao, *Taiwan.*

Maj. Gen. Vibulcheep Boon-Long, Dr. Svasti Daengsvang, Dr. Charanpat Isarangkun, Dr. Sunitya Sinhabaedya, Dr. Songkram Supchareon, and Dr. Smarn Suwanrit, *Thailand;* Dr. T. Zaouche, M. Ahmed Balma, M. Rachid Azouz, and Dr. J. Daire, *Tunisia;* Dr. N. Karabuda and Dr. T. Alan, *Turkey.*

Dr. J. J. Du Pre Le Roux and Dr. F. W. Schulenburg, *Union of South Africa;* Dr. Victor Andres Belaunde, Dr. M. G. Candau, Philippe de Seynes, and Dr. Harry S. Gear, *United Nations;* Dr. Ricardo Cappeletti, *Uruguay;* Dr. Nguyen-van-Nguyen, *Vietnam;* Dr. Andrija Stampar and Dr. Joza Brilej, *Yugoslavia.*

United States technical assistance in Chile demonstrates how public health activities may merge with community or area development.

Public Health in Chile

By E. ROSS JENNEY, M.D., M.P.H.

THE RIBBON of land that is Chile is a much more logically bounded nation than it appeared to be when we first noticed its odd shape in our school geographies. In spite of its bizarre stretch from the bleak deserts of the north to the wet forests of the south, it forms a true geographic unit in the sense that it is a terrace between the world's longest mountain wall on the east and the emptiest reach of ocean on the west. It is strikingly like our own west coast in reverse latitudes, and the similarity of the Chilean and California central valleys brings frequent comment. But, unlike our west coast, it lies very much alone, a narrow, walled-off strip of sovereignty.

Chile does not have, as does our west coast, the immense advantage of being a part of a huge nation stretching to the Atlantic, which can supply capital and markets. Nor has it had, from the founding of Santiago in 1541 down to recent years, the advantage of those cultural drives that in the United States blocked the transplanting of European feudalism. Landed estates—the *fundos*—were carrying family names into the third colonial generation when the Pilgrims touched Plymouth Rock, and until 30 years ago no change of the *patrón-péon* relationship was in sight. This rigid land tenure system molded economic and social life for four centuries, but it failed to cope with the needs precipitated by an increasing population in the 20th century competitive world. Failure was cloaked for a time by rich mineral revenue, first from nitrates and then from copper, but the country's economic inadequacy was eventually reflected in constantly increasing food deficits.

Although a paradoxically progressive and unusually comprehensive social legislation has been spread over this scene, it was supported in its early days by export products largely developed by foreign capital. Much of the national income has been derived by negotiation abroad rather than by economic planning at home, a practice which perhaps has had the effect of stultifying the concepts of self-development. Between the remnants of Iberian feudalism and the beginning of trends toward socialism, planned community and area development had no sponsor. This situation may be a major key to the slow progress in environmental sanitation.

Dr. Jenney was on assignment from early 1953 to early 1955 in Santiago, Chile, as chief of the health and sanitation field party of the Institute of Inter-American Affairs, Foreign Operations Administration. His current assignment has taken him to Rio de Janeiro, Brazil, where he is chief of the health, welfare, and housing field party of the IIAA, now a part of the new International Cooperation Administration, Department of State.

Health Priorities

In planning technical assistance in public health, the first priority for any area is always the major plagues that can be assailed with

simple, effective techniques at small cost. Malaria and yaws have become classic examples. But where there are no such challenges, what then? What should we do in Chile, where no major scourges await penicillin or DDT? Here a literate, progressive, democratic, white population of 6 million people live in a favorable climate. There are no cultural blockades to hamper health measures. Indeed, highly trained Chilean technicians are drawing foreign students to their country, and many are serving abroad as public health consultants. In such an environment, less developed only in the economic sense and not handicapped by any natural health hazards, the impelling need is to contribute some technique that does not degenerate into a mere operational convenience and a vehicle for dollar credits. The problem, then, is to determine priorities on the basis of public health's most significant impingement on the economic dilemma without losing the integrity of the program by actually departing from the field of public health.

The health problems of Chile are not those of geographic environment and insect vectors. The major factors in disease incidence are those commonly associated with economic stress in a rapidly growing, overcentralized, somewhat stratified white society living in a temperate climate. Medical care has produced a substantial decrease in the incidence of those diseases which yield to therapy or which can be controlled by immunization. Poor progress has been made in health situations which are best handled by community effort inspired by local civic enterprise, that is, in environmental sanitation, housing, and nutrition.

A Socioeconomic Problem

Excreta disposal methods and water sources in rural areas have improved little since the colonial period. Latrines are often placed over irrigation ditches, which are the usual source of domestic water. The plentiful underground water sources have scarcely been touched. Population increase is greatly exceeding housing construction, and this situation is aggravated by disorganized population shifts resulting from industrialization and urbanization. Mushroom shanty towns—the *callampas*—surround Santiago, Concepción, and many other cities. Recent agricultural deficits and inflationary prices have added to an existing dietary deficiency. A definitely low health standard in nutrition coupled with poor sanitation is reflected in the notably high infant mortality rate, which was 252 per 1,000 live births in 1936 and has only recently dropped below 150.

This well provides the first underground water ever seen in Peumo. It was dug by the men of the household, and cement capping and pumps were bought on credit from the Servicio.

The health services of Chile are almost completely socialized. The huge Beneficencia system, which had taken over the health services once provided by the church, was absorbed by the new National Health Service in 1953. Thus, sick benefits, hospitals, medical service, and public health were centralized in one large federal agency employing more than 33,000 persons. Many years will be required to put this organization in working order in a decentralized pattern. In the major cities medical services and facilities are of a high order, al-

though seldom elaborate, but this standard drops rapidly to a low level in country districts and to a near nil in the remote areas. Among the latter are the desert towns of the north, where water may be sold by the liter, and the forest lands of the far south, where 100,000 people live on the remote shores of the world's most intricate labyrinth of inland waters.

To find a sound footing for technical assistance in public health in a socioeconomic milieu of this type is a severe challenge. In such a highly centralized population (nearly one-third live in Santiago), one can expect little help from urban interests in planning programs for rural areas, where the present need is greatest and where the future hope of the economy most likely rests.

The Health Servicio

The United States, through the Institute of Inter-American Affairs, has been providing technical assistance to Chile since 1943. As in other Latin American countries, the cooperative health program of the two governments is carried out through a Servicio, a special agency of the host government. During the first several years of the program, a commendable series of demonstrations was produced—complete health centers, sewage systems and disposal plants, rural and urban water systems, tuberculosis sanatoriums, strategic hospital construction and equipment projects, a building for a dried milk plant, assistance to the School of Public Health in Santiago, and others. Training of Chileans in health was an important part of these demonstrations, and more than a hundred trainees were sent to the United States. Although there can be no doubt as to the success of this period and although the projects have been turned over to the appropriate agency of the Chilean Government, the demonstrations, as such, soon reached their own limit of feasibility. An approach to more basic problems was sought.

In any economy there are gaps that need closing and bottlenecks that need widening, and some of these can be remedied in part with public health measures. When such a gap or bottleneck is identified and when the value of the remedial measure as a demonstration in relation to its cost is determined, a priority is established. This approach is, to be sure, one that views technical assistance in public health as one aspect of economic betterment.

In Chile, rural sanitation and community self-sufficiency appeared to be the developmental gaps pertaining most directly to both the socioeconomic scene and to public health. Improvement in rural sanitation required control of excreta disposal and the tapping of underground water sources, the latter having an important bearing on agriculture as well as health. Development in community self-sufficiency required a plan to demonstrate the advantages of full utilization of local autonomy and to stimulate community initiative and sense of social responsibility. These objectives were combined by the health Servicio in a community development project in a rural area southwest of Santiago. This project, called the Peumo project after the town where the work is concentrated, was begun in 1951 with Dr. Theodore I. Gandy as chief of party.

The Peumo Project

The area from which a site for a community development project was selected includes about 3,750 square kilometers of land and has a population of nearly 150,000. A few hours' drive from Santiago, it provided both the prerequisite of representative rurality and the administrative advantage of being accessible to the Servicio headquarters. The area is a fertile one. Citrus fruit, avocados, olives, and rice were grown extensively, but practically no vegetables were raised for home consumption. Contaminated surface water was used by more than 90 percent of the population in and around Peumo, and sanitary disposal of excreta was almost nonexistent. The early effectiveness of educational techniques used in approaching these two problems permitted a rapid extension of the project into other fields, including agronomy, home economics, and housing construction. In the process of extension, the project spontaneously evolved into a community development program acquiring local acceptance and participation, step by step.

No effort was made to define sharply the categories of activity; they fell easily into the basic pattern of health education, sanitary engineer-

ing, agronomy, and self-help housing. Agronomy soon included all phases of home economics. Operation of the project was based in a local headquarters, which contained offices, workshops, warehouses, a guest house, and recreation facilities. Existing citizen committees were utilized, and new ones were created to facilitate local participation. The resident chief of the project was an engineer on the staff of the National Health Service.

The transfer of technically trained Chilean personnel from the urban centers to this rural area resulted in the project's staff becoming involved in a host of activities that were peripheral to the first intent—suggesting recreational devices, designing a market, and planning improvement of the local hospital, for example. The quick wit of the community in availing itself of this indigenous but previously unavailable talent suggests that at least one cause for the lack of development in rural communities stems from an urban concentration of specialized skills rather than from any local recalcitrancy to technical innovation, lack of aptitude, or obtuse "cultural obstacles."

Similar experience in community development has been derived at San Felipe, where in 1947 Chilean authorities, with assistance from the Rockefeller Foundation, began a project in which agronomy was combined with health center activities. The home economics phase of the San Felipe project has been notably successful in securing local response.

The health education phase of the Peumo project was so effective that there has been a consistent backlog of orders for latrines, wells, and pumps. Latrines are made with concrete base and riser with a seat of the type conventionally used in flush toilets. The wooden house has a pressed-asbestos sheet roof. Wells are capped with concrete and are supplied with the kind of hand pump commonly used in rural areas in the United States. The property owner digs his own latrine pit and well, and he buys the latrines and imported pumps on credit. Deep wells are drilled for large farms and for small community water supplies. A pattern now emerging is for communities to raise all or part of the funds for development of a well and water system before they request assistance. Sometimes the Chilean Ministry of Public Works cooperates in such projects.

The program in agronomy began with spraying, fertilization, and cultivation of orchards, thus winning acceptance by initial concentration on improving the yield of cash crops. From this beginning, it branched easily into the purchase of seed for home gardens, food preserving, and home economics in general, all carried out by women's clubs. In an area accustomed to importing vegetables, the savings made in the home budget were quickly appreciated. Farmers soon formed cooperatives for collective purchasing of agricultural supplies and equipment heretofore seen only on the large estates.

Cement-block machines are provided for the self-help housing program. A cooperative of families is divided into three groups, and each group pools its labor force to construct one house at a time. Woodworking machinery is made available to the cooperative, and all materials are supplied on credit, the cost being reimbursed in modest monthly payments.

The Peumo project demonstrated two important lessons that may be assumed to be generally applicable to Chilean rural life. The first of these is that the use of local participation in an attempt to introduce a single improvement may lead spontaneously to a more inclusive community development project in which short-term impact can be combined with long-term advantages. The second lesson is that a Chilean rural community is eager and able to achieve group action in response to proffered assistance, to mobilize its resources, and to produce solutions to community problems with technical guidance and modest credit. Success in this respect is facilitated by choosing a locally felt need for initial action and only later fulfilling the possibly more basic needs, the knowledge of which has been engendered by education. This approach is what Foster terms "taking advantage of the pragmatic nature of people," 1 of 12 essentials he lists for community development (*1*).

Under other circumstances, the health Servicio might have considered reproducing the Peumo project in various locations throughout Chile to exploit the potential of this method of stimulating self-help. The disadvantage of this procedure would be that its success would

An agronomist explains how to grow vegetables among trees, as part of the Peumo project. Vegetables were formerly purchased from a distant town at high prices.

be dependent on the effectiveness of demonstrations arranged in a spotted distribution pattern. In a country 2,600 miles long, with valleys isolated from one another by a rugged terrain, the spread of even the most contagious idea is geographically handicapped. Instead, the health Servicio chose to take advantage of the opportunity to participate in an area development program initiated by the Ministry of Agriculture and the agricultural Servicio.

The Area Development Program

The plan for an area development program in Chile came into being in 1953. It evolved from the decision of the Ministry of Agriculture and the agricultural Servicio to concentrate their cooperative efforts in a large area of the country in order to produce a significant demonstration of methods which might correct the agricultural deficit so embarrassing to the national economy. Several national and international agencies are now participating in the program, which covers the three provinces of Maule, Ñuble, and Concepción in south central Chile, with a population of about 750,000. Although the agricultural phase has been in full swing for 2 years, the health Servicio has only recently joined the program.

This area development program, or Plan Chillán, as it is called, offered an opportunity for integrating rural sanitation demonstrations with agricultural activities in a flourishing program sufficiently significant to attract national and international attention. With such integration, each community can sense the relation between its own efforts in health and the efforts of the area toward general economic betterment. The economic interdependence of health and agriculture can be demonstrated. This vitally important concept, it is felt, can be understood more readily through the medium of a large collective endeavor than through segmented programs located here and there.

The basic philosophy of the technical assistance program for public health in Chile, then, is this: A health project expanded into a community development program can carry improved technology to the community more effectively when it is devised as a partner in a team with agricultural and other activities. It can travel further into the national consciousness by this means than as an independent project. Even when a health project is very much a minor partner in a program, it is not in danger of losing its identity; on the contrary, it profits by its association with an endeavor that reaches national recognition and enjoys central government support.

Past experience has illustrated advantages of

integrated activity. In our own Tennessee Valley Authority enterprise, for example, each phase of the program, including health, achieved greater recognition through its association with TVA. In addition, the pooling of resources in a single economic objective draws host government ministries together and provides the opportunity for what may well be the greatest contribution of technical assistance, that is, the demonstration that integrated activity is a primary requisite of progress.

Summary

With a successful pilot project in community development behind it, the health Servicio in Chile is now directing its major effort toward giving rural people a stake in economic affairs by developing underground water and by stimulating concepts of community responsibility in health, as part of an area development program. These priorities were not derived by attempting to round out a health service in all its branches. Rather, they evolved from an effort to find one or two negotiable, long-range concepts that most certainly and most directly would improve the economy and living standards through health channels.

At the same time, there is a growing conviction among workers in Chile that where health problems are part of a socioeconomic complex (as opposed to concise environmental problems yielding to specific technical methods) they can be solved most readily by incorporating health activities in a broad endeavor, such as an area development program.

REFERENCE

(1) Foster, G. M.: Guidelines to community development programs. Pub. Health Rep. 70: 19–24, January 1955.

Rehabilitation Gains

In the first year after enactment of the Vocational Rehabilitation Act of 1954, the State-Federal rehabilitation program has tooled up under the new law, adjusted to related legislation, and laid the foundation for the future, according to the Office of Vocational Rehabilitation, Department of Health, Education, and Welfare.

The new legislation is designed to bring about a progressive expansion in the vocational rehabilitation programs. Improved rehabilitation services, support of training courses and traineeships for badly needed rehabilitation workers, and special research or demonstration projects are making it possible to increase the number of handicapped workers returned to productive employment.

Approximately 58,000 disabled persons became gainful workers during fiscal 1955—an approximate increase of 2,000 over the preceding 12 months. Federal grants amounting to $30 million are available for the basic support of State and Territorial vocational rehabilitation programs in 1956. An additional $2.6 million, to be matched with State funds, is scheduled for use in expanding rehabilitation centers.

The related legislation is the Social Security Act of 1954 and the 1954 Medical Facilities Survey and Construction Act. The State agencies determine whether a handicapped person is eligible to have his period of disability eliminated from the calculation of his monthly social security benefits. They are also concerned with surveys and plans to determine the needs for construction of comprehensive rehabilitation facilities.

The Food and Drug Administration

—A Protector of Public Health—

By BRADSHAW MINTENER, LL.B.

ONE can hardly overestimate the importance of food, drugs, and cosmetics as a part of the human environment. Purity of these products is a health essential, yet any of the many thousands of products can deteriorate or be debased or contaminated in ways that will be injurious—even fatal—to the user. And, of course, any of them can be adulterated or mislabeled to serve the ends of deception and fraud.

Concern for health was largely responsible for the passage of the original Pure Food and Drugs Act of 1906. It had become known that poisonous preservatives and dyes were being used extensively in food products, that drug addiction was growing because of the unrestricted sale of remedies containing narcotics, and that a great many people were suffering tragic consequences because of their reliance on the claims being made in the labeling of widely advertised medicine. There is no doubt that the protection of health was and is the primary objective of our Federal food and drug laws, which will have their 50th anniversary in 1956.

The relation of drugs to health is direct and obvious. The law requires them to be pure, fully potent, and labeled with adequate directions for safe and effective use. Food is required to be sound and wholesome, free of filth or harmful contaminants. Cosmetics, similarly, are required to be made from ingredients that are safe for use on the human body. Therapeutic devices must be labeled for their safe and effective use in treating diseases for which they are recommended. All these objectives are sought via the regulatory mechanism of prohibiting the shipment of misbranded or adulterated articles in interstate commerce.

In addition to the direct health importance of the foregoing requirements, the Federal Food, Drug, and Cosmetic Act imposes many requirements that have an indirect bearing on the health of the Nation. For example, it prohibits false and misleading claims on drugs which may lead the public to rely upon ineffective products rather than to seek competent medical care. Through food standards the law seeks to maintain the integrity of food so that consumers will get the nutritional values they have a right to expect. The enrichment of food under the law has made a decisive contribution to the elimination of deficiency diseases which once took thousands of lives every year.

Health violations—those which may be injurious to consumers—hold first place in the Food and Drug Administration's enforcement policy. Second are the sanitary violations, including those that may not be dangerous to

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Mr. Mintener, assistant secretary for Federal-State relations, Department of Health, Education, and Welfare, delivered the address on which this paper is based at the 73d annual convention of the Proprietary Association held in White Sulphur Springs, W. Va., May 24, 1955.

health but offend common decency. Third are the economic violations—the marketing of products that cheat or swindle the consumer in some way, particularly products that cannot be detected by the reasonably alert purchaser.

While priority is given to those problems and cases involving health, there is an inevitable overlapping of these three fields of action. A sanitary violation may be a health violation. An economic violation, such as the substitution of an inferior or worthless ingredient in a food or drug, may also be a health violation. FDA inspectors are trained to work on all three. An inspector who is working on a suspected health violation will not overlook what he may find in the way of a filth violation or a serious economic violation. Sometimes the same product may violate in all three respects. For example, in the enforcement of the standards for cheese promulgated under section 401 of the act, the Food and Drug Administration is interested in this product from the following different standpoints:

Health—whether the manufacturer has met the requirements for using pasteurized milk or storing the cheese a sufficient length of time to cause the death of any pathogenic organisms which may be present.

Sanitation—whether the cheese was made from clean milk or cream in a sanitary plant. This has its obvious relation to health.

Economic—whether the product has been made from the ingredients required to be used in that particular kind of cheese and contains the minimum fat content and not more than the maximum moisture content permitted by the standards. Such requirements can be tremendously important in preventing the debasement of food in order to gain an economic advantage.

In the past there have been various proposals to split up the work of the Food and Drug Administration among other Government units according to functions or to products. Actually the present arrangement is much more efficient because one inspector ordinarily handles all of these different kinds of work and is not concerned entirely with food, or with sanitation, or with economic frauds. He works on all of them, but of course health comes first. Due to limitations of funds and staff, FDA now does very little by way of enforcing the law against economic violations, and it has had to reduce somewhat its work against sanitary violations. It is trying to maintain full protection against health violations, but even in this area there are some activities which should be strengthened.

The Food Field

What are some of the specific health activities carried on by the Food and Drug Administration in the food field? At the top of the list would be the efforts to prevent the use of poisonous or deleterious ingredients and contamination by dangerous micro-organisms. A few years ago the alertness of an FDA inspector prevented the shipment of a large lot of frozen peaches to which thiourea had been added to retard darkening. Thiourea is an acutely toxic chemical, capable of causing death.

On numerous occasions food and drug inspectors visiting food plants have spotted careless use of sodium fluoracetate (compound 1080). When used properly this compound is a very effective rodenticide, almost instantly fatal in extremely small amounts. Of course, it should be used only in locations where there cannot be any possibility of spillage on stored food products. Last fall thousands of pounds of frozen broccoli were voluntarily destroyed by packers after the inspectors found that several farmers had sprayed their fields with the wrong insecticide.

During a recent inspection of a plant making frozen chicken pies the FDA man found in the cold storage room a large number of pies that had soured due to accidental delay between making and freezing. None of the pies had been distributed, and the owner voluntarily destroyed the lot when he learned of their condition. Many people could have been made seriously ill if these pies had left the plant.

In the poultry and rabbit program the Food and Drug Administration is concerned with keeping diseased poultry and rabbits out of food channels. As a matter of fact, in all of the food programs, the agency is concerned with possible routes of contamination and hence possible vectors of infection as well as the adequacy of processing to prevent both the transmission of disease organisms and spoilage of the food which might cause illness.

Somewhat closer to the interests of the proprietary drug industry is the program of checking on the enrichment of staple foods with vitamins and minerals to insure that these foods contain the full amount of these essential food elements. Also there is the dietary food program designed to insure adequate labeling of these foods to protect the health of diabetics, hypertensives, and others with special dietary requirements. Recent labeling regulations for low sodium foods and the vitamin testing activities carried on by the Division of Nutrition illustrate the health significance of the work done in this area.

The basic requirements of the Federal Food, Drug, and Cosmetic Act with respect to drugs may be summarized as safety, effectiveness, and correct labeling. Obviously, these are closely related to each other. Safety means safety for use according to the directions given on the label or recommended to the physician. Efficacy means effectiveness for the conditions for which the drug is offered or recommended. Obviously, a drug which lacks the potency declared on its label, or is otherwise ineffective, may be unsafe, particularly if used for serious illness.

One of our serious public health problems is reliance upon ineffective remedies and treatments promoted by quacks and charlatans, some of whom masquerade as scientific authorities. The Food and Drug Administration can deal with only one aspect of this broad problem by enforcing the law against interstate shipment of quack remedies and worthless devices.

The Drug Field

Some of the many programs in the drug field are concerned especially with the adequacy of controls over the compounding and labeling of drugs. The wrong ingredient or the wrong label can have disastrous consequences. So can the accidental contamination of drugs or the lack of sterility in products whose use requires them to be sterile. Sometimes in the interest of public health and safety it becomes necessary to clear the market of a drug that is dangerous because it is defective or misbranded. During the past fiscal year there were 32 such episodes. In all of these, fortunately, the records of the manufacturer were found adequate to trace all shipments, and it was not necessary to issue public warnings. In most instances the drug firms themselves were the first to notify the Food and Drug Administration when adverse reports were received regarding one of their products.

The law, of course, contains the multiple seizure provision in section 304(a) which enables the Government to remove from the market products which the courts have found to be adulterated or misbranded or, as the law says, "when the Secretary has probable cause to believe . . . that the misbranded article is dangerous to health, or that the labeling of the misbranded article is fraudulent, or would be in a material respect misleading to the injury or damage of the purchaser or consumer." This section is obviously of great importance from a public health standpoint since it enables the Government to act effectively when the shipper of the goods is unwilling or unable to correct a violation.

Distribution of new drugs before their safety has been established pursuant to section 505 is an offense that is rarely encountered. When it is considered that the ten-thousandth new drug application became effective in June 1955, it is clear that the last 15 years have seen an outstanding advance not only in medical research but also in drug regulation for the protection of public health. It is particularly fortunate that many high-powered therapeutic agents discovered during this miracle drug era have been restricted to use under medical supervision. At the same time as experience is gained, it is found that some of these new drugs can be safely used by the layman. When that is the case the law requires that such drugs be labeled with adequate directions for such use. Recently, a definite procedure has been established for making this change in the status of a new drug. This regulation provides for public notice of such changes, allowing an opportunity for interested persons to state their views regarding the proposed change.

Among many other health responsibilities is the testing and certification of coal-tar colors to insure their harmlessness and suitability for use in food, drugs, and cosmetics. The testing and certification of insulin is vital to health because of the necessity for precise dosage in the use of this drug.

Antibiotic drugs, which are administered to millions of persons for prevention or treatment of serious diseases, are likewise tested and certified by the Food and Drug Administration, thus guaranteeing to manufacturer, physician, and patient that they were safe and fully effective when they left the manufacturer's establishment.

There is the sampling and testing of such therapeutic devices as surgical sutures for required tensile strength and clinical thermometers for correct readings.

The cosmetic program is directed primarily toward protection of health. FDA investigates particularly cosmetics which may be dangerous—those containing new ingredients, the safety of which may not be fully established, or those misbranded by seriously misleading claims.

Then there is the enforcement program against the illegal sale of prescription-legend drugs by pharmacists and others, especially such habit-forming and dangerous drugs as the barbiturates and amphetamines.

Enforcement of the Caustic Poison Act is another of FDA's health responsibilities. The poison label and antidotes on certain household chemicals have helped greatly to reduce the toll of injuries and accidental deaths of children. I have been glad to learn of the interest the proprietary industry is taking in educating the public against carelessness in the use and storage of common household remedies. Many people seem to be oversold regarding the complete safety of some of these products, and they leave them where they can be readily sampled by young children.

New Problems

This discussion would not be complete without consideration of new health problems involving foods and drugs. Some of these are with us now. Others loom on the horizon and must be anticipated by study on the part of both Government and industry.

Only a few weeks ago several thousand commercial packages of foods were exposed to an atomic explosion at the Nevada proving grounds. Similar tests on drugs have already been made and reported. The tests are made, of course, to learn what protection is provided by packaging and other factors against radioactive contamination. FDA already has considerable experience in this field and is conducting a series of training courses for State and local health workers to prepare them for their responsibilities in this area of civil defense.

An FDA Food Industry Advisory Committee, named by the National Research Council, is collaborating in studies of the vulnerability of food-processing plants to atomic, chemical, and bacterial warfare attack, and likewise of the decontamination measures needed in the event of such attack.

But civil defense is not FDA's only concern with regard to atomic energy. Radioactive drugs are becoming of increasing importance, and the radiation sterilization of foods is now the subject of intensive research by other Government and private organizations. FDA is not as active in this general area as it should be considering its health responsibilities. Similarly, such new developments as the increasing employment of hormones and other potent drugs in livestock feeds, the increasing use of chemical additives in commercial food processing, and the proposed use of antibiotics as food preservatives demand that FDA's research facilities be expanded so that adequate attention will be given to the health side of these new developments.

We cannot consider the health responsibilities of the Food and Drug Administration without being impressed by the tremendous size of the job which this organization tries to accomplish. And when we consider the size of the organization—around 800 people working on enforcement operations, about 200 of them available for inspection work—we wonder how they do it. The fact is, of course, that they have been able to do only a partial job. For example, in 1954 they were able to inspect about 10 percent of the approximately 96,000 plants and warehouses which do a substantial interstate business in food, drugs, or cosmetics. At that rate each plant would be inspected about once in 10 years.

This obvious discrepancy between the size of the job and the facilities for the job led to the appointment of the Citizens Advisory Committee on the Food and Drug Administration.

This committee of 14 distinguished, public-spirited citizens, financed by a special appropriation of Congress, has made a thorough investigation.

Based on its findings, the committee has recommended a substantial increase in the facilities and staff of the Food and Drug Administration to be accomplished in a period of 5 to 10 years.

The committee also recommended much greater emphasis on use of the techniques of trade and public education to accomplish the objectives of the law. For example, it recommended action to inform the public in specific terms against quackery, especially where real hazard to health is involved. To promote understanding of the prescription requirements of the law, the committee recommended that more effective means be found for educating physicians and pharmacists concerning these requirements and for developing mutual understanding between them and the public. Finally, it recommended increased representation of the Food and Drug Administration at meetings of State and local food and drug or health officials.

If these and other recommendations of the citizens committee can be carried out, I am sure there will be better understanding of the role of the Food and Drug Administration as a public health agency and better cooperation by all who are concerned about the effective enforcement of our pure food and drug laws.

Poliomyelitis Vaccination Assistance Funds

Funds have been allotted to each State under the $30 million Poliomyelitis Vaccination Assistance Act signed by President Eisenhower August 12, 1955.

The law apportions the money in accordance with a formula which considers the number of unvaccinated children under age 20 and expectant mothers in each State, the relative per capita income of the State, and the per capita cost of vaccine. Of the $30 million appropriated by Congress, $25 million is available only for the purchase of vaccine, and $5 million may be used for the costs of planning and conducting poliomyelitis immunization programs or for the purchase of vaccine. The funds are to be used by February 15, 1956.

While the vaccine may be administered by private physicians and by nonprofit organizations as well as by public agencies, the law provides that in vaccination programs conducted by public agencies no "means test" may be used to limit eligibility. Persons who are under 20 or are pregnant are eligible.

State	*Allotment*	*State*	*Allotment*	*State*	*Allotment*
Alabama	$986, 907	Massachusetts	$686, 853	South Dakota	$156, 769
Arizona	209, 167	Michigan	1, 007, 656	Tennessee	863, 814
Arkansas	646, 637	Minnesota	593, 448	Texas	1, 714, 995
California	1, 597, 864	Mississippi	917, 196	Utah	166, 281
Colorado	240, 586	Missouri	661, 848	Vermont	78, 718
Connecticut	246, 065	Montana	115, 672	Virginia	768, 384
Delaware	42, 118	Nebraska	245, 862	Washington	384, 315
District of Columbia	100, 608	Nevada	25, 541	West Virginia	488, 270
Florida	677, 027	New Hampshire	88, 295	Wisconsin	610, 539
Georgia	992, 329	New Jersey	644, 386	Wyoming	56, 069
Idaho	138, 225	New Mexico	201, 754	Alaska	77, 240
Illinois	1, 133, 062	New York	1, 727, 103	Hawaii	100, 359
Indiana	640, 435	North Carolina	1, 257, 807	Puerto Rico	1, 169, 790
Iowa	490, 128	North Dakota	160, 718	Virgin Islands	10, 941
Kansas	361, 222	Ohio	1, 167, 504	Canal Zone	15, 702
Kentucky	800, 637	Oklahoma	489, 949	Guam	22, 751
Louisiana	764, 696	Oregon	269, 842	American Samoa	12, 758
Maine	200, 910	Pennsylvania	1, 570, 896		
Maryland	385, 123	Rhode Island	115, 211	Total	$30, 000, 000
		South Carolina	701, 198		

By THEODORE J. BAUER, M.D.

NEW headquarters for the Public Health Service Communicable Disease Center has been authorized by Congress, and construction is expected to begin as soon as financing and construction bids are approved. Site of the new facilities is a 14-acre plot donated by Emory University and located adjacent to its campus in suburban Atlanta, Ga. The headquarters will consist of six separate buildings grouped together and interconnected.

The Communicable Disease Center is a division of the Bureau of State Services. CDC attacks the problem of communicable diseases by conducting investigations and demonstrations, providing training, offering consultation, and giving epidemic and disaster aid to State and local health departments. The center came into being in 1946 when its predecessor, the Office of Malaria Control in War Areas (MCWA), was terminated following the close of World War II.

MCWA began its malaria control activities on March 17, 1942, from headquarters in Atlanta. During its first year, projects were under way, employing more than 2,600 men in 93 areas in 15 States, the District of Columbia, and Puerto Rico. These projects benefited 450 war establishments, including military, industrial, housing, and recreational installations, and afforded protection to several million persons connected with the war effort. In early 1946, MCWA launched an extended program, with a budget of $12 million and a staff of 4,500 persons.

Housing for MCWA activities was temporary and scattered. Office space was at a premium in the early days of the war. As the organization grew, so did its demand for additional space. Temporary and makeshift facilities did not pose an insurmountable problem for a wartime organization concerned primarily with field operations. However, with the transition to CDC's broad communicable disease control program, the need for space to house laboratory, training, and other pertinent activities became acute. The number of technical and laboratory personnel had increased steadily, while the number of unskilled and skilled laborers and other nontechnical personnel had declined sharply.

The new headquarters will provide the facili-

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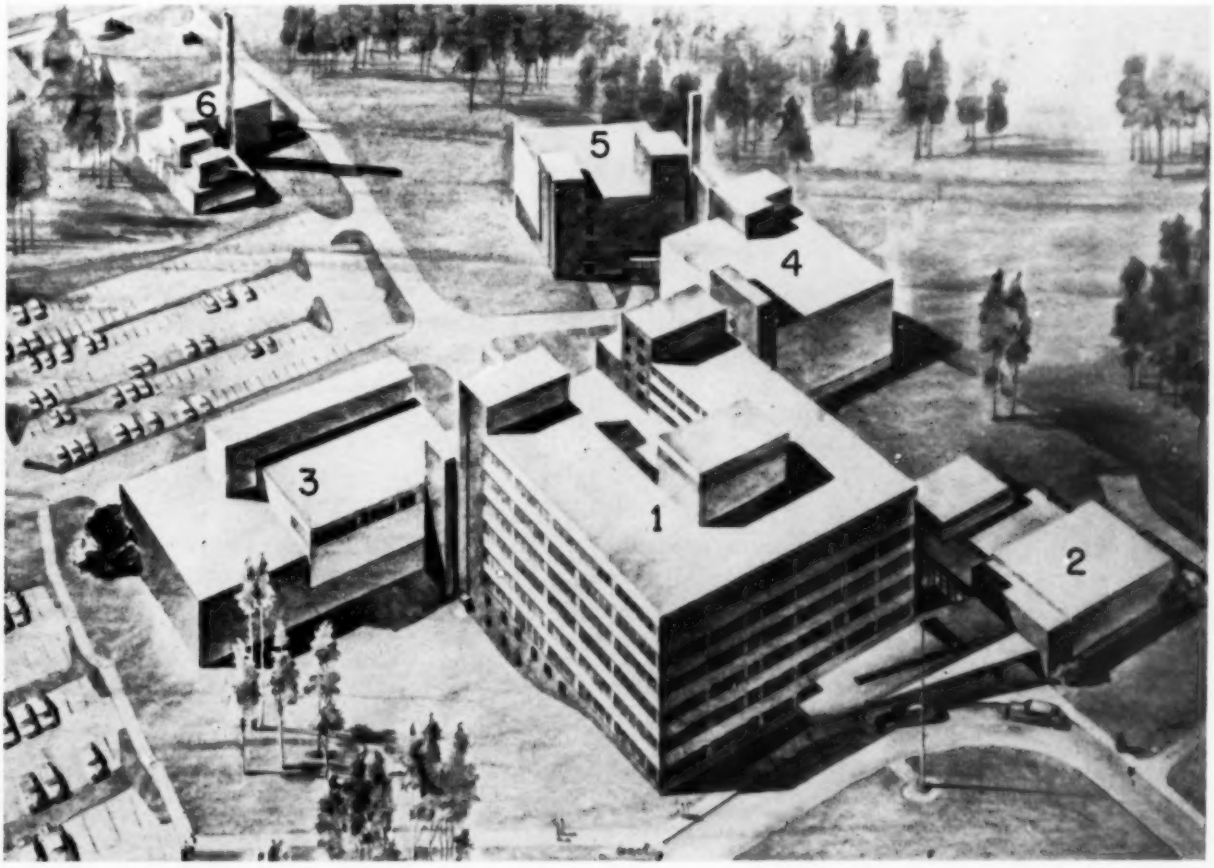
ties needed. In the main building, ① in the sketch, with a net area of 105,014 square feet, a broad peripheral area devoted to office space will rise 8 stories high, while the central portion which it bounds will be 4 stories high. The outer area will provide space for training facilities and for personnel who perform administrative and other services essential to support of the operating branches; the central area is to house research and training laboratories. The training facilities will consist primarily of lecture rooms and demonstration laboratories to be located back to back with a projection booth between. Lounge-reading rooms in this area will be readily accessible for use by all lecture and laboratory groups.

The auditorium and cafeteria, ②, will be in a 2-floor building designed to provide facilities convenient for both employees and visitors to the center. The auditorium will be adequate for large classes and conferences, and the cafeteria will offer accommodations for the regular staff, as well as for trainees and guests. In addition, there will be a lobby, a kitchen, and a service area. The net area for this structure is to be 7,482 feet.

The audiovisual services buildings, ③, will be a 4-floor structure designed to accommodate the specialized equipment and operational processes used in the production and distribution of motion pictures, filmstrips, exhibits, and other visual or audio materials. This building will house a sound stage for indoor production; a soundproof recording room, and a photomicrographic studio protected against vibration; facilities for film processing, printing, and editing; a film distribution center; and a training area with adequate flexibility to meet the increasing demand for training in the production and utilization of films. Total area of the audiovisual services building is to be 25,407 square feet.

It was imperative to plan for space apart from the main building where studies requiring the handling of highly infectious materials could be pursued. Two buildings, ④ and ⑤,



were designed to meet this need: the virus building and the infectious disease building. Each is planned to provide maximum safety for workers within the building and to minimize the potential hazard to others at CDC.

The infectious disease building, to contain 5 floors, will be situated apart from the main building but connected to it by open corridors at each floor level. It is designed to house laboratories for studies on infectious diseases other than viral and to provide quarters for experimental animals required in this work. Here, also, special studies on potential agents of biological warfare will be conducted. A net total of 14,836 square feet of space is provided for laboratories, 7,255 square feet for animal quarters, and 5,246 square feet for central services.

The virus building will be a 5-floor structure also, and is designed to house the bulk of the Virus and Rickettsia Section laboratory activities including reference diagnostic work, training, consultation, and methodology research. It provides a net total of 27,937 square feet of space for these activities.

The power house, ⑥, will be located apart from the other five buildings. It will house a gas-fueled central heating system and equipment to provide hot water, distilled water, compressed air, and refrigeration. Its 2 floors will contain a gross area of 10,580 square feet. Storage will be provided for a supply of oil to be used in case of temporary failure of the gas supply and for electrical generators as a source of power in case of failure in the regular supply.

All of the buildings will be air conditioned, and adequate parking space on the grounds will be provided for employees and visitors.

Utilization of space in the buildings has been planned to meet the need for versatility posed by varied activities associated with communicable disease control. Animal space and much of the office space can be converted for use as laboratories if necessary. The buildings can be expanded without disruption of activities. This includes vertical extension of the central laboratory portion in the main building and the addition of an office wing.

The construction of these buildings will allow the CDC, for the first time, to assemble its headquarters activities at one location. Now they are located in some 65 buildings in Atlanta and Chamblee, Ga., and at Montgomery, Ala. Many of these buildings are temporary structures, unsuitable for laboratory work, and expensive to maintain.

Air Pollution Control Act

An Air Pollution Control Act, approved by the President July 14, 1955, provides for a 5-year $25 million Federal aid program in this field.

The law also authorizes an annual appropriation of $5 million to the Department of Health, Education, and Welfare for administering the law and for grants-in-aid to State and local government air pollution control agencies and to other public and private agencies and individuals for research, training, and demonstration projects.

The provisions encompass the development of methods for eliminating or reducing air pollution, surveys of specific air pollution problems upon request of State or local air pollution control agencies and recommendations for their solution, and collection and dissemination of information useful in combating or preventing air pollution.

One of the youngest of the voluntary national health agencies, United Cerebral Palsy, is making a fight against the crippling condition that affects more than half a million people in the United States today.

United Cerebral Palsy

—Its Growth and Present Status—

By GLIDDEN L. BROOKS, M.D., and ISIDORE ALTMAN, Ph.D.

CEREBRAL PALSY has been defined by Phelps as "comprising a group of conditions which affect the control of the voluntary motor system and which have their origin in lesions of various parts of the brain" (*1*). Among the more common clinical signs are lack of balance, awkward posture and gait, uncontrollable movements of the arms or legs, and impaired speech, hearing, and vision. At least half of all cases also suffer some degree of impairment of mental capacity. In addition, disturbances of perception may be present.

The nature and extent of the disability depend on the location and the extent of the damage to the brain. The damage may occur before, during, or after birth, or subsequently as the result of a head injury, encephalitis, poisoning, or other brain-injuring situation. However, the great majority of the cerebral palsied sustain brain injury during the prenatal or paranatal period. Among the likely etiological factors are anoxia, brain hemorrhage, prematurity, blood incompatability (Rh factor), and malformation of the brain.

The precise incidence and prevalence of cerebral palsy remain to be established. Estimates based on the few scattered surveys that have been made indicate that the prevalence rate is approximately 3 to 3.5 cases per 1,000 population and that there are about 570,000 cases in the United States today. The Children's Bureau has estimated that "somewhere in the neighborhood of 285,000 children under 21 in the United States in 1952 have cerebral palsy either from birth or as a result of subsequent brain damage" (*2*).

Cerebral palsy presents many more kinds of problems than just those of medical care. It presents special problems in the fields of education, psychology, vocational guidance and training, and recreation. Because of the involved relationships between parent and afflicted child, programs are also needed for family education and counseling. An added problem is the provision of transportation and

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its attendant costs, for many of these children could not otherwise be moved to and from their various activities.

The Associations

United Cerebral Palsy Associations, Inc., came into being in 1949. The reasons for its existence and for the existence of similar organizations have been ably expressed by Courville (*3*): "A new trend in the attack on disease, one introduced even before the beginning of World War II, is the association of lay and professional groups in an attempt to answer the questions posed by some particular disorder. The lay representatives owe their interest as a rule to the fact that some member of their own family is a victim of the disease in question. The professional groups are those whose special training or interests naturally incline them to its study. It is this common concern for the social as well as the medical effects of a given condition which unites the two groups in seeking a solution to the problem."

United Cerebral Palsy was founded through the efforts of parents of the cerebral palsied. On April 1, 1954, it had 356 affiliates, with affiliates in all States and the District of Columbia. It has grown, in terms of contributions from the public, from an organization with an initial income in 1950 of $1,022,000 to one with an income in 1954 of $8,242,000.

Autonomous Affiliates

The local affiliates are autonomous, raising their own funds and expending these funds as they see fit, except that 25 percent of their income is used for participation in the national program. It is they who assume the responsibility for seeing that services are provided for cerebral palsied persons who live in their communities. State offices have been established in a number of States mainly for the purpose of stimulating and coordinating local activity. These are supported by locally determined percentages of income, generally about 5 percent. The national office promotes the growth of the organization, provides specialists for advice and assistance to local affiliates in the development of services, fund raising, public relations, and legislation, and fosters a research and training program through grants.

The objective of a local affiliate is to make certain that the needs of the cerebral palsied are being met. This means mobilization of community resources through financial support of agencies providing some of the services, seeking legislation for services that government should provide, case finding and evaluation of resources, and the actual establishment and operation of facilities where this is deemed the most effective means of providing services.

A Selected Local

Because United Cerebral Palsy is still a rapidly growing organization and because size and growth of program vary considerably from community to community, it is difficult to assess the success with which the objective just stated is being achieved. Instead of a nationwide examination, the activities of one of the older affiliates will be described as indicative of the trends in the development of affiliate programs.

The selected local United Cerebral Palsy agency made a total expenditure of $70,000, in round figures, for services in the year ending June 30, 1954—$24,000 for medical services, $35,000 for education, $5,000 for recreation, $1,000 for parent education and counseling, and $5,000 for transporting cerebral palsied persons to places where they could receive these services.

The medical program to which the affiliate contributed $24,000 is administered by a children's hospital connected with an outstanding medical school. Its cerebral palsy unit provides screening for purposes of diagnosis and all the facilities and personnel necessary to speech, occupational, and physical therapy. During the year, 267 patients were served on an outpatient basis; of these, 129, or 48 percent, were under 5 years of age. It is important to successful prognosis that the child be brought to treatment as early as possible.

The funds for education were devoted largely to the maintenance of a nursery school, with 28 children, in the medical center mentioned above. The $20,000 contributed by the affiliate made up a fifth of the nursery school's total budget. Another $10,000 went for educational purposes in

a hospital devoted to the rehabilitation of handicapped children. The remaining $5,000 helped to maintain an industrial school for crippled children, which last year had 43 cerebral palsied enrollees.

Recreational activities consist in bringing children to a center one day a week for games, art work, and even dancing. One of the notable achievements of this particular affiliate is the formation of a choral group made up of cerebral palsied adults. Other affiliates contribute to the general support of summer day camps and residential camps or meet the costs for a number of cases.

Parents meet at bimonthly intervals to hear authorities speak on various aspects of cerebral palsy. In addition, individual counseling is provided on social and health development of the child and on such specific problems as feeding, dressing, and exercising. The parents themselves contribute a considerable amount of voluntary services in raising funds, furnishing transportation, taking the children on outings, and the like.

While this local organization incurred no expenditures for services of a vocational nature, cerebral palsied adults have been placed in employment or for training through consultation with rehabilitation agencies and workshops in the community. A number of affiliates of United Cerebral Palsy maintain sheltered workshops where training and jobs are provided to fit the capacities of the handicapped individual, while other affiliates provide counseling or offer vocational services.

Thus, the affiliates of United Cerebral Palsy make a contribution to public health progress through the active support of diagnostic and treatment centers and other services to alleviate a handicapping condition which is costly to the community, both economically and socially. They make a further contribution through support of a research program which seeks to find the causes of cerebral palsy and thereby to prevent it.

The National Office

The function of promoting research and the training of professional personnel, on the whole, is vested in the national office. The method followed in making research grants is patterned for the most part after the system developed by the National Institutes of Health. Applicants for grants must have a university affiliation or be connected with some other responsible and recognized institution to which the money is actually paid. Applications are received and rated by a research advisory board made up of distinguished neurologists, surgeons, pediatricians, and specialists in other fields related to cerebral palsy. A medical executive board reviews the recommendations of this and other advisory boards and makes final recommendations to the lay governing body. Up to September 30, 1954, United Cerebral Palsy has spent almost $1,400,000 for its research and training program.

To date, the emphasis of this program has been mainly on basic neurological research, oriented toward the goal of prevention. The number of grants made for research into problems of education, social development and adjustment, and mental status is expected to increase. Research projects currently under way fall into five broad groups of studies:

1. The physical structure of the normal and damaged brain.
2. The chemical structure of the normal and damaged brain.
3. The function of the normal and damaged brain.
4. Causes of brain damage.
5. The nature and characteristics of the cerebral palsied.

The training program consists of (*a*) direct grants to the American Physical Therapy Association and the American Occupational Therapy Association for training recruits in their respective fields; (*b*) summer workshops for teachers and therapists at eight colleges and universities; (*c*) fellowships for dentists and dental hygienists; (*d*) support of postgraduate courses for therapists; and (*e*) miscellaneous training programs.

The program division of the national office, which is charged with developing principles of program services and with general supervision of the research and training grants, carries on active liaison with other national agencies in such related fields as public health, education, and rehabilitation. It is represented on com-

mittees and boards of the National Health Council, American Public Health Association, International Council for Retarded Children, American Occupational Therapy Association, and other similar organizations. United Cerebral Palsy recognizes full well that it will take the concerted efforts of many national agencies, in cooperation with government, to conquer the disorder in which it is particularly interested.

One of a Group

United Cerebral Palsy is now one of a group of prominent voluntary national health agencies which perform an important function in public health. By concentrating on a single disorder or group of disorders, these associations can provide or support a high level of service and bend special efforts toward ultimate eradication. In the community, they bring together a devoted group of lay and professional people in a dedicated cause.

As for cerebral palsy specifically, Surgeon General Scheele, in addressing the 1954 convention of United Cerebral Palsy, had this to say: "It is an old public health axiom, proved seventy times seven, that however massive and complex a problem may be, it will eventually be solved by attacking its various elements one by one. The success of the attack depends upon the breaking down of the broad problem into a series of research problems and solving them. This approach is especially valuable in the attack on cerebral palsy . . .

"The idea of preventing a large share of the cases of cerebral palsy now occurring each year may seem like a dream. But I believe that it is a distinct possibility. I believe too that medical research is on the threshold of other important discoveries that will greatly improve the status of many victims of cerebral palsy. Only through persistent research effort in the many specific areas of cause and prevention, treatment and rehabilitation can we truly vanquish this enemy that causes so much heartbreak and suffering."

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Scholarships in Cancer Research

The National Research Council's Committee on Growth is accepting applications for American Cancer Society grants to assist young scientists during the critical early period of their careers in cancer research.

Awards are made for 3-year periods at $6,000 annually with possible renewal for 2 additional years. Applications should be submitted by institutions on behalf of candidates not later than January 1, 1956. Forms and information may be obtained from the Executive Secretary, Committee on Growth, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C.

Occurrence of Influenza July 1954 to June 1955

By Dorland J. Davis, M.D., Dr.P.H.

SPECIFICALLY diagnosed influenza has been reported to the Influenza Information Center of the World Health Organization Influenza Study Program in the United States since 1948. This information comes from investigators and diagnostic laboratories located in universities, hospitals, and Federal and State agencies, including Army, Navy, and Air Force installations. The weekly summaries of these reports and those received from other countries are published in the Communicable Disease Summary of the National Office of Vital Statistics, Public Health Service, and distributed to health officials and interested research workers in the United States and other countries. As part of the worldwide effort sponsored by the World Health Organization, this program seeks to improve the reporting of influenza and the exchange of newly isolated strains of influenza virus for investigational purposes. The present communication will consider the experience in the United States in the period July 1954 to June 1955.

During the previous winter season, 1953–54, influenza was almost totally absent from the United States and Western Europe. In the year before that, 1952–53, influenza A occurred in epidemic proportions in the United States, principally in the midwest and the south, with a small but noticeable concurrent increase in mortality rates. During the late winter of 1951–52, influenza B occurred widely in the United States in localized outbreaks with no appreciable fatality rate. In the season before that, 1950–51, there were epidemics of influenza A in the United States, particularly the northeastern part, which had been preceded by sharp outbreaks in England and Western Europe.

Influenza was reported during the winter months of this last year, 1954–55, in scattered areas of the United States, particularly the eastern seaboard, and was almost exclusively due to type B virus. The first suggestion of influenza came from New York State during the third week of December, with an outbreak of influenza-like respiratory disease in a school. During the first part of January, high rates of absenteeism due to illness were noted in junior and senior high schools in Washington, Norfolk, Boston, and other cities of the eastern seaboard. The clinical features of the illness were of short duration and resembled influenza. Virus isolation and serologic studies later showed that many, if not the major proportion of cases, were due to influenza B.

The first reported isolation of influenza B virus in the country was from an unvaccinated patient at the Great Lakes Naval Training Station, Ill., whose onset occurred during the last week of December. This strain was antigenically similar to the strain recovered the previous year at the same installation. Influenza B continued during January in the eastern part of the country, and scattered reports of localized outbreaks were received from the midwest. In military installations, the rate of respiratory diseases remained relatively low, but cases of influenza, principally type B, were diagnosed serologically and by virus isolation at a number of posts throughout the United

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Specimens for Influenza Diagnosis

The specific diagnosis of influenza type A, B, or C can be made only by laboratory examination.

The laboratories collaborating in the Influenza Study Program have facilities for specific diagnosis. Their locations may be obtained from State and Territorial health departments or from the Influenza Information Center, National Institutes of Health, Bethesda 14, Md.

The two most commonly used methods are specific isolation of the virus and demonstration of a rise in specific antibody by the hemagglutination inhibition test or the complement fixation test.

Samples for virus isolation should be obtained as early as possible in the acute phase of illness by collecting throat washings or throat swabs in a small amount of sterile bacteriological broth, skim milk, or serum-saline solution. These samples should be frozen at low temperatures unless taken to the laboratory within a few hours.

Two consecutive serum samples (drawn from a minimum of 5 cc. of blood) are necessary for serologic diagnosis. Single samples are of no value. The first sample should be taken as early as possible during the illness and the second about 14 days after onset. Separate serum is desirable. Clotted whole blood may be forwarded if time of transit is short, but it must not be frozen.

All such specimens should be sent to the nearest collaborating laboratory.

States. Influenza vaccine had been administered routinely to all military personnel early in the winter season.

In early February, reports continued of outbreaks, particularly among junior and senior high school students, and a number of colleges reported high incidence of respiratory illness, which later was shown to be due to influenza B virus. The disease was reported in Maine, Michigan, the southwestern States, California, and Oregon, and must be presumed to have occurred in many other States. In some areas such as Michigan, isolated cases of influenza B were diagnosed without the recognized occurrence of sharp outbreaks during this same period. Although in most areas of the country the incidence declined in the latter part of February, cases continued to be diagnosed in some areas, including California, during March, April, and May.

For the first time in 2 years, influenza A virus was recovered from a patient in a New York State institution, with onset on March 1. Shortly thereafter, influenza A virus was also recovered in another institution in New York, and complement fixation tests on paired serums identified three other cases of influenza A in the same institution, having onsets in the middle of March. In April, additional cases of influenza A were diagnosed serologically in New York and California, and sporadically in military installations. No other isolations of influenza A virus were reported during the remainder of the July 1954–June 1955 period.

Influenza C was recognized serologically in areas where special effort was made to diagnose it, and one isolation was reported, but there was no evidence that it was a cause of epidemic respiratory disease.

Isolations of influenza virus and positive diagnostic serologic tests (any technique) reported by civilian and military laboratories participating, continental United States and Alaska

Month and year	Isolation of virus, type			Positive serologic tests, type		
	A	B	C	A	B	C
1954						
December	0	1	0	2	38	6
1955						
January	0	83	0	9	100	4
February	0	68	1	14	108	3
March	3	9	0	12	121	3
April	0	0	0	7	33	4
Total	3	161	1	44	400	20

The table shows a total of 629 reports of both virus isolations and serologic diagnoses of influenza from all the cooperating laboratories, including military laboratories, and gives a rough indication of the prevalence of the disease in the winter months. A total of 161 strains of influenza B, 3 strains of influenza A, and 1 strain of influenza C were isolated, and 400 positive diagnostic serologic tests for influenza B, 44 positive serologic tests for influenza

A, and 20 positive serologic tests for influenza C were reported.

Reports from the World Health Organization Headquarters, Geneva, the Canadian WHO Influenza Information Center, and from the World Influenza Center, London, indicated that influenza B began to occur sporadically in northern England and Wales in November and continued during December and January. In January, influenza B outbreaks were occurring in Canada, northern Holland, and later in the month, in Germany and Yugoslavia. As in the United States, the disease attacked principally school children. In February, WHO reports indicated continued outbreaks of influenza B in Europe, including Finland, and in different parts of Japan, particularly Tokyo. In March and April, influenza A infections were recognized serologically and by virus isolation in several widely separated areas of Great Britain, particularly southern Wales. It is of interest that the experience with influenza infections was similar in the United States, Canada, and Western Europe. Briefly, this was the occurrence of scattered outbreaks of influenza B, sometimes of considerable intensity, occurring chiefly among school children, beginning in the early winter and continuing through February. In March, a few influenza A infections were recognized in both Great Britain and the United States, the first due to this type in 2 years.

Antigenic studies at several laboratories showed that the isolated strains of influenza B were similar to each other and very close to the B/GL/1/54 strain isolated in the Great Lakes Naval Training Station in March 1954. They differed somewhat from those isolated in 1950–52 and even more from the B/Lee strain of 1940. Preliminary antigenic analysis of the influenza A strains recovered in this country and Europe indicate general similarity to each other but also some variation from those recovered in previous years. Detailed studies are being undertaken to define more precisely the antigenic patterns of these recently recovered strains in the expectation that they may be important during the coming year.

Data collected by the National Office of Vital Statistics reveal that the number of deaths ascribed to influenza and pneumonia increased moderately in February, but most of this may be regarded as the usual seasonal increase in deaths from respiratory disease. The total mortality rate during the winter months was not noticeably increased.

Veterinarians' Entrance Salaries Raised

All Federal agencies were authorized last month to increase the starting salaries of grade GS–7 professional veterinarians from $4,930 to $5,200 annually. Veterinarians already employed at this grade will receive a minimum of $5,200 a year.

The United States Civil Service Commission acted under legislation authorizing Federal recruitment at above minimum rates for particular jobs in areas in which the Federal Government is at a competitive disadvantage with private industry. The action became effective October 23, 1955.

Study by the Civil Service Commission revealed that $5,200 a year more nearly approximates the salaries offered by non-Federal employers at the entrance level than the starting salary authorized by the Commission last June.

Effect of Topical Fluorides On Teeth Matured on Fluoride-Bearing Water

By Donald J. Galagan, D.D.S., M.P.H., and Jack R. Vermillion, B.S., M.P.H.

EARLIER STUDIES have been concerned with the effect of topically applied fluorides on dental caries experience in the permanent teeth of children in areas with fluoride-free water supplies (*1–7*). These investigations demonstrated that four applications of a 2-percent solution of sodium fluoride to the teeth of children not previously exposed to fluoride reduce the incidence of new caries in sound teeth by 40 percent.

The effect of topical fluoride therapy on teeth matured on fluoride-bearing water has not been thoroughly explored. There is a single report in the literature suggesting that topically applied fluorides do not influence caries experience in such teeth (*8*). Therefore, a study was designed to test further the caries inhibiting effectiveness of a 2-percent sodium fluoride solution applied directly to teeth of children continuously exposed to water having an optimum concentration of fluoride.

The study was conducted in Tucson, Ariz., from January 1953 to April 1954. The water supply in the southside section of Tucson contains 0.7 p.p.m. fluoride, an optimum concentration for the particular climatic and environmental conditions existing in south central Arizona (*9, 10*). In the southside section there is a fairly large school population from which to draw continuous residents with a common history of exposure to fluoride-bearing water.

The application technique developed in earlier Public Health Service studies was used in this test (*11*). In alternate children, teeth in the right quadrants were treated four times with a 2-percent sodium fluoride solution after an initial prophylaxis. The teeth on the opposite side were given four applications of tap water at the same sitting. In the remaining children the teeth on the left side were treated with sodium fluoride, the control teeth with tap water. The children were examined just prior to treatment, and again 1 year later. The treated quadrants were not identified during either examination.

The study group consisted of 350 continuous resident children aged 7 to 16, and equally distributed by sex and age. At the end of the 1-year period, 282 students were available for reexamination. Of these, 142 had been treated on the left side of the mouth and 140 treated on the right side. The results of this study are based on analysis of these 282 children, whose age distribution follows.

Age	*Number of children*	*Age*	*Number of children*
7	10	12	33
8	39	13	30
9	38	14	15
10	44	15	22
11	47	16	4

A summary of the incremental dental caries during the study year is presented in the table. Ninety-two of the 2,342 noncarious treated teeth and 101 of the 2,324 noncarious untreated teeth became carious during the year. The observed difference shows a 9 percent lower caries incidence in the treated teeth. However, this difference is within the limits of chance variation and might have occurred had the children been given no treatment at all.

The data presented here neither confirm the

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Dental caries experience during the study year in fluoride-treated and untreated permanent teeth and percent less new caries experience in fluoride-treated teeth of 282 school children in Tucson, Ariz.

Mouth quadrants	Noncarious teeth, April 1953	New carious teeth, April 1954	Percent less new caries experience in treated teeth
Upper jaw			
Treated	1, 207	48	7. 7
Untreated	1, 199	52	
Lower jaw			
Treated	1, 135	44	10. 2
Untreated	1, 125	49	
Both jaws			
Treated	2, 342	92	8. 9
Untreated	2, 324	101	

previous finding (*8*) nor indicate that topical fluoride applications are effective when used on teeth matured on fluoride-bearing water, since the 9-percent reduction demonstrated may be attributable to chance variation. Further study of greater numbers of children is indicated before any conclusions can be drawn.

An unusually large number of children are required to demonstrate significant changes in caries experience in fluoride areas where caries activity is already low and the potential for caries prevention is small. It would be possible to demonstrate statistical significance of a 9-percent incremental difference between treated and untreated teeth if it were observed in a minimum of 2,900 Tucson children. It will be difficult to determine precisely the effect of topically applied fluorides on teeth matured on fluoride-bearing water until a fairly large community has had a fluoridated water supply for 15 years or longer.

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The Yale Study

Experience of Public Health Workers

By EDWARD M. COHART, M.D., WILLIAM R. WILLARD, M.D., and ERLEEN F. JAMISON, M.P.H.

•Few workers entered public health at the beginning of their careers. About one-fourth had had at least 10 years' experience in other fields before coming into public health. Most commonly such experience was in hospitals and related institutions and in business and industry.

•The most frequent determinants in the choice of a public health career were chance, personal contacts, and the inherent attraction of the work. Only 2 of 595 workers could attribute their choice of this career to formal vocational guidance.

•Laboratory personnel differed from other health department personnel in that a relatively high proportion of them entered public health fortuitously at the beginning of their careers.

•The average health department staff worker had spent 9.2 years in public health. Personnel at higher administrative levels had an average of 14.6 years of public health experience.

•High-echelon personnel felt, to a much greater extent than did staff personnel, that opportunities to learn about administration and about the community had been their most valuable experiences. Staff personnel stressed opportunities for learning specific techniques.

•Salaries of high-echelon personnel tended to increase with years of experience, except in the medical and administration services. This did not hold true for staff personnel, among whom the worker with long experience not infrequently earned less than his less-experienced co-workers.

These were the findings of the study of the work experience of public health workers that was conducted in the course of the Yale Public Health Personnel Research Project. Such information is one of the foundations for a better understanding of the problems involved in the recruitment and efficient utilization of workers. The findings of the present study cannot be considered conclusive, but they do offer clues for further investigation. Moreover, the study served to demonstrate the application of the method evolved by the Yale project for obtaining knowledge of the public health worker and his job.

Detailed data from the study of work experience are presented in the following pages. The information was secured from more than 600 professional and semiprofessional workers in State and local health departments and visiting nurse associations in Connecticut, Maryland, Michigan, and New York. The sample and the method used were described in the May issue of *Public Health Reports*, pages 447–452.

Total Work Experience

Ninety percent of public health personnel in high administrative positions (supervisor and

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Table 1. Duration of total work experience of personnel in State and local health departments [1]

Administrative level and service	Number supplying information	Percent with stated number of years' experience			
		1–4	5–9	10–19	20 or more
High-echelon					
Medical	67	3	4	34	59
Nursing	80	1	8	39	52
Sanitation	38	0	3	42	55
Laboratory	28	4	0	32	64
Administration	15	0	27	27	46
Health education	8	0	12	50	38
Statistics	10	10	10	30	50
Other	31	3	6	42	49
Total	277	2	7	37	54
Staff					
Medical	12	8	25	17	50
Nursing	96	16	23	21	40
Sanitation	65	11	18	29	42
Laboratory	85	32	28	22	18
Health education	14	14	14	50	22
Statistics	21	14	20	33	33
Other	24	17	17	33	33
Total [2]	317	19	22	26	33

[1] Includes visiting nurse associations.
[2] Total percentages are only approximations, because the staff-level sample was not equally representative of all services.

higher rank) and 60 percent in staff positions (junior and senior staff) had had at least 10 years' total work experience (table 1). Half of the former and one-third of the latter had worked 20 years or longer.

Length of work experience did not differ materially for personnel in State and local health departments, nor did it differ significantly among the services for high-echelon personnel. At staff-level, however, the members of the laboratory service tended to have had less experience than personnel in the other services. Three-fifths of this group, as compared with one-third of the workers in the other services, had had less than 10 years' experience.

Experience Outside Public Health

A large proportion of the workers did not enter public health at the beginning of their careers. Five-sixths of the personnel had worked in other fields (table 2). More than half had less than 10 years of such experience, and about 20 percent, 10 to 19 years. Less than 10 percent had had 20 or more years' experience before they entered public health. There was no essential difference between the workers in State and local agencies or between high-echelon and staff-level personnel in this respect, but

Table 2. Duration of experience outside public health of personnel in State and local health departments [1]

Administrative level and service	Number supplying information	Percent with stated number of years' experience				
		None	1–4	5–9	10–19	20 or more
High-echelon						
Medical	68	7	31	29	21	12
Nursing	84	14	36	26	22	2
Sanitation	36	20	33	31	8	8
Laboratory	27	44	15	19	15	7
Administration	15	7	20	20	40	13
Health education	7	14	0	29	43	14
Statistics	10	10	10	50	20	10
Other	31	10	13	32	29	16
Total	278	15	27	28	21	9
Staff						
Medical	12	0	50	17	25	8
Nursing	96	9	38	32	18	3
Sanitation	66	15	21	27	26	11
Laboratory	84	33	30	19	11	7
Health education	14	21	29	36	14	0
Statistics	21	29	38	19	14	0
Other	24	4	38	29	25	4
Total [2]	317	18	32	26	18	6

[1] Includes visiting nurse associations.
[2] Total percentages are only approximations, because the staff-level sample was not equally representative of all services.

again the laboratory service differed from the other services. Forty-four percent of the high-echelon and 33 percent of the staff laboratory workers, as compared with 12 percent of the personnel in the other services, had worked only in public health.

Approximately 25 percent of the personnel had worked in other fields than public health for 10 years or longer. This percentage does not appear to be inordinately high in the light

Table 3. Areas of experience outside public health of personnel in State and local health departments [1]

Administrative level and service	Number supplying information	Percent with experience in—							
		Business, industry	Government agency [2]	Schools	Colleges	Welfare, social agencies	Private practice	Hospitals, institutions	Other
High-echelon									
Medical	63	16	10	2	25	8	54	49	9
Nursing	73	12	7	20	14	7	34	67	12
Sanitation	36	56	25	8	19	0	8	0	3
Laboratory	16	44	19	12	44	0	12	12	0
Administration	15	60	47	7	0	7	0	13	13
Health education	7	57	14	29	43	43	14	0	0
Statistics	9	56	56	0	22	11	0	11	0
Other	30	20	30	37	10	37	20	53	7
Total	249	28	18	14	19	10	28	41	9
Staff									
Medical	12	33	8	17	17	0	50	50	0
Nursing	87	24	5	7	5	7	40	72	6
Sanitation	60	77	23	5	12	0	12	2	0
Laboratory	58	45	19	17	12	2	9	38	2
Health education	11	54	9	27	0	0	9	9	9
Statistics	15	80	27	47	20	0	0	0	13
Other	33	33	15	18	3	21	27	21	3
Total [3]	276	46	14	13	9	5	23	36	4

[1] Includes visiting nurse associations.
[2] Not including schools, hospitals and related institutions, and health and welfare departments.
[3] Total percentages are only approximations, because the staff-level sample was not equally representative of all services.

of the general job mobility that prevails in the United States.

The contention that most physicians in public health enter the field after a long period of private practice is not borne out by this study. Only half of the physicians interviewed had been in private practice at any time during their careers. Only one-third had spent as long as 10 years in fields other than public health, and only 10 percent, as long as 20 years.

Hospitals and related institutions and business and industry were the most common areas in which public health personnel had worked (table 3). About 40 percent had been employed in each of these areas. One-half of the physicians and three-fourths of the nurses had been employed in hospitals. More than half of the workers in most of the other services had been employed in business or industry. One in every six workers had been employed by a Government agency other than a health or welfare department, hospital, or school. One in seven had worked in a school, and a similar proportion in a college. Roughly, 5 percent had been employed by a welfare or social agency.

State and local personnel showed no major differences in past experience, but significant differences were found between high-echelon and staff workers. A larger proportion of staff than of high-echelon personnel had worked in business or industry, but the reverse was true in relation to previous employment in colleges.

Reason for Entering Public Health

The three most frequent determinants for entering public health were chance, personal contacts, and the attraction of the work (table 4). Each of these was given by slightly more than 20 percent of the workers. Less than this per-

centage gave favorable working conditions as their reason for entering public health. About 10 percent stated that they entered public health because of specific education and training for this career. Three other factors, namely, a "calling" to do public health work, political appointment, and the use of a public health job as a means of education or training for another career, played negligible roles.

Chance as a reason for entering public health requires no amplification. Those who gave attraction of the work as their reason for entering public health were expressing one of the two concepts: either that the content of public health work was inherently varied, challenging, and satisfying, or that the work provided opportunities for helping people. Of those who gave personal contacts as their reason for being in public health, the majority stated that these contacts were with public health workers. A small number stated that they entered public health because of casual informal counseling, but only 2 of 595 workers could attribute their entry into public health to formal vocational guidance.

The most attractive aspect of working conditions in public health appeared to be the hours of work. One-quarter of those who gave working conditions as their reason for entering public health mentioned this factor specifically. Salary and job security were each mentioned by one-sixth of these workers.

Reasons for entering public health did not vary with either governmental or administrative level. The one outstanding difference among the services was that a greater proportion of laboratory workers than of personnel in the other services entered public health fortuitously. Whereas less than one-quarter of all public health workers came into the field by chance, chance accounted for the entry of two-fifths of the laboratory workers.

Table 4. Reasons given for entering public health by personnel in State and local health departments [1]

Administrative level and service	Number supplying information	Percent giving stated reason							
		Chance	Personal contacts	Work content	Working conditions	Education and training	"Calling"	"Stepping stone"	Political appointment
High-echelon									
Medical	66	12	24	29	21	9	3	0	2
Nursing	81	9	25	28	12	21	4	1	0
Sanitation	39	18	44	5	13	13	0	5	2
Laboratory	28	39	36	0	7	11	0	4	4
Administration	14	43	0	14	36	0	0	0	7
Health education	8	38	12	25	0	12	0	0	12
Statistics	10	40	20	10	20	10	0	0	0
Other	34	24	35	24	6	12	0	0	0
Total	280	19	28	20	14	13	2	1	2
Staff									
Medical	12	8	8	17	42	25	0	0	0
Nursing	88	14	18	28	20	16	3	0	0
Sanitation	68	20	15	18	25	7	3	3	9
Laboratory	84	41	17	15	15	5	0	7	0
Health education	14	21	37	7	21	14	0	0	0
Statistics	18	55	22	11	0	6	6	0	0
Other	31	26	16	26	23	0	6	3	0
Total [2]	315	26	18	20	20	9	2	3	2

[1] Includes visiting nurse associations.
[2] Total percentages are only approximations, because the staff-level sample was not equally representative of all services.

Public Health Experience

Sixty-three percent of the personnel in administrative positions and 33 percent of the staff had had 10 or more years' experience in public health (table 5). Thirty percent of the former and 15 percent of the latter had been engaged in public health for 20 years or longer. High-echelon personnel had spent an average of 14.6 years in public health; staff personnel, an average of 9.2 years. Except for the fact that more State (84 percent) than local (44 percent) sanitation personnel in the higher administrative echelons had been employed in public health for 10 years or more, there were no significant differences between State and local personnel. Neither were there significant differences among the services.

The number of years that the personnel had spent in their present agencies is to be found in table 6. Approximately one-third of all high-echelon personnel had worked in their present agencies for less than 5 years; one-quarter, 5 to 9 years; another quarter, 10 to 19 years; and one-sixth, 20 years or longer. Roughly half of the staff personnel had been with their present agencies for less than 5 years; one-quarter, 5 to 9 years; one-sixth, 10 to 19 years; and one-tenth, 20 years or longer. There was only one significant difference between State and local personnel. Almost half of the high-echelon sanitation personnel in State health departments had worked for the same agency for 20 years or longer, but none of the high-echelon sanitation personnel in local health departments had had such experience.

Three-quarters of the high-echelon personnel in public health for 10 to 19 years had worked for the same agency for a like period of time; half of those with longer public health experience had spent at least 20 years in their present agency. The experience of staff personnel was

Table 5. Duration of public health experience of personnel in State and local health departments [1]

Administrative level and service	Number supplying information	Percent with stated number of years' experience			
		1–4	5–9	10–19	20 or more
High-echelon					
Medical	67	18	24	24	34
Nursing	82	7	17	48	28
Sanitation	41	5	27	39	29
Laboratory	28	18	0	32	50
Administration	14	29	14	43	14
Health education	8	25	50	0	25
Statistics	10	30	20	30	20
Other	34	32	32	18	18
Total	284	16	21	33	30
Staff					
Medical	12	42	17	33	8
Nursing	89	43	26	13	18
Sanitation	69	48	17	15	20
Laboratory	77	44	33	18	5
Health education	13	23	46	15	15
Statistics	21	43	9	24	24
Other	33	36	18	33	12
Total [2]	314	43	24	18	15

[1] Includes visiting nurse associations.
[2] Total percentages are only approximations, because the staff-level sample was not equally representative of all services.

Table 6. Years in present agency of personnel in State and local health departments [1]

Administrative level and service	Number supplying information	Percent with stated number of years in present agency			
		1–4	5–9	10–19	20 or more
High-echelon					
Medical	68	40	25	24	12
Nursing	84	34	32	24	10
Sanitation	39	23	18	31	28
Laboratory	28	36	11	25	28
Administration	15	33	27	27	13
Health education	8	50	38	12	0
Statistics	11	36	18	27	18
Other	31	62	16	16	6
Total	284	38	24	24	14
Staff					
Medical	12	58	17	17	8
Nursing	95	54	25	12	10
Sanitation	65	54	17	12	17
Laboratory	85	53	27	15	5
Health education	14	43	36	7	14
Statistics	21	24	28	24	24
Other	24	50	17	25	8
Total [2]	316	51	24	14	11

[1] Includes visiting nurse associations.
[2] Total percentages are only approximations, because the staff-level sample was not equally representative of all services.

Table 7. Past experiences that State and local health department [1] personnel have found particularly valuable

Administrative level and service	Number supplying information	Percent in specified category						
		General learning	Knowledge of community	Administration	Philosophy	Specific technical procedures	Interpersonal relations	Other
High-echelon								
Medical	67	28	40	15	27	18	19	13
Nursing	83	41	31	36	14	13	23	24
Sanitation	39	51	28	20	13	36	15	10
Laboratory	28	29	4	36	7	29	14	18
Administration	15	27	13	67	7	0	0	20
Health education	8	12	25	12	0	62	12	25
Statistics	10	70	0	30	0	30	20	0
Other	31	6	45	19	13	13	23	32
Total	281	34	30	28	15	20	18	19
Staff								
Medical	12	25	42	8	8	8	25	17
Nursing	95	26	17	5	5	16	34	28
Sanitation	66	24	9	20	4	44	35	4
Laboratory	83	20	5	11	0	40	4	31
Health education	14	7	36	29	0	57	7	14
Statistics	20	5	5	10	0	30	15	25
Other	24	21	21	12	0	38	17	8
Total [2]	314	22	13	12	3	32	22	21

[1] Includes visiting nurse associations.
[2] Total percentages are approximations only, because the staff-level sample was not equally representative of all services.

similar. Three-quarters of those with either 10 to 19, or 20 or more years' experience had worked for their present agency for comparable periods.

Most Valuable Experiences

The workers were questioned about the attributes of their total work experience which they considered most valuable, and 1 to 3 answers were obtained from each respondent. These were classified in seven categories, as follows: (*a*) knowledge and appreciation of the community, which covers comments concerning communities and their components in general, as well as specific communities, and techniques for working with community groups and individuals; (*b*) knowledge and appreciation of organization and administration, which covers all phases of management and supervision; (*c*) development of a philosophy of public health or government; (*d*) learning about interpersonal relations and development of qualities of personality that would promote good relations; (*e*) learning specific technical procedures, including the techniques of communication; (*f*) learning about public health generally and about working in a public health organization; and (*g*) a residual category, which includes statements too general to be classified under any of the other categories.

Either because their past experiences had been different or because they viewed their past experiences differently, high-echelon and staff personnel differed as to what they considered most valuable (table 7). Approximately one-third of the former and one-fifth of the latter were impressed with the general learning opportunities that their experience had provided. The opportunities for learning about the community and for learning about administration were considered important by one-third of the personnel at the higher administrative levels but by only one-eighth of those at staff level.

Whereas 15 percent of high-echelon personnel felt that their past experience was particularly valuable because of the opportunities it afforded them to develop a philosophy of public health, only 3 percent of staff personnel gave this reason. One-third of the staff personnel, as compared to one-fifth of the personnel in higher positions, emphasized the opportunities for learning specific technical procedures as being particularly valuable. Only in regard to experience in interpersonal relations were the staff and higher administrative groups similar. One-fifth of each group felt that their past experience was unusually valuable because of the experience it gave them in interpersonal relations.

There were also a number of striking differences among the services. Among high-echelon personnel, members of the laboratory service mentioned knowledge of the community infrequently. A relatively large proportion of medical personnel emphasized philosophy. A larger percentage of sanitation and laboratory personnel than of medical and nursing personnel stated that the opportunities in their past experience for learning specific technical procedures were especially valuable.

Among staff personnel, members of the medi-

Table 8. Relation between public health experience and salary of high-echelon personnel in State and local health departments [1]

Service and duration of experience in years	Number supplying information	Percent with stated salary					Mean salary
		$3,000–3,999	$4,000–5,999	$6,000–7,999	$8,000–9,999	$10,000 or more	
Medical	64	0	5	17	42	36	$9,300
1–9	26	0	0	27	35	38	9,300
10–19	16	0	1	19	44	25	8,800
20 or more	22	0	4	4	50	41	9,500
Nursing	81	28	62	10	0	0	4,500
1–9	19	47	53	0	0	0	4,000
10–19	39	20	72	8	0	0	4,500
20 or more	23	26	52	22	0	0	4,900
Sanitation	42	10	40	26	19	5	6,300
1–9	13	15	62	23	0	0	5,000
10–19	16	6	38	31	19	6	6,700
20 or more	13	8	23	23	38	8	7,200
Laboratory	28	4	50	18	14	14	6,700
1–9	5	0	40	40	20	0	6,300
10–19	9	11	44	11	11	22	6,700
20 or more	14	0	57	14	14	14	6,800
Health education	20	20	55	20	5	0	5,200
1–9	11	27	64	9	0	0	4,500
10–19	6	17	50	17	17	0	6,000
20 or more	3	0	33	67	0	0	5,800
Statistics	10	30	30	20	20	0	5,500
1–9	5	60	20	20	0	0	4,300
10–19	3	0	67	0	33	0	6,200
20 or more	2	0	0	50	50	0	7,500
Administration	14	29	43	14	14	0	5,500
1–9	6	17	50	0	33	0	6,000
10–19	6	50	33	17	0	0	4,700
20 or more	2	0	50	50	0	0	6,500
Other	33	15	67	6	9	3	5,400
1–9	21	19	71	5	5	0	5,000
10–19	6	0	50	17	17	17	6,800
20 or more	6	17	67	0	17	0	5,200

[1] Includes visiting nurse associations.

cal and health education services emphasized the opportunities for learning about the community, but such opportunities seemed to be of relatively little importance for sanitation, laboratory, and statistics personnel. Relatively few physicians and nurses mentioned learning specific technical procedures as important.

Salary and Experience

Because of salary differentials associated with service, the relation of salary to public health experience was investigated for the several services separately, as shown in tables 8 and 9. The average salary of staff nurses was less than that of any other service group of staff workers. The staff physician earned more than twice as much as staff workers in the other services. A relatively smaller differential existed between the salaries of staff and high-echelon personnel in the medical service than in the other services.

Except that a significantly larger proportion of State than of local nurses at the higher administrative levels earned $4,000 a year or more, and that a significantly larger proportion of State than of local sanitation personnel at the higher administrative levels earned $5,000 a year or more, there were no significant State-local differences. Inasmuch as 19 percent of the State nurses and 25 percent of the local nurses had had less than 10 years' experience in public health, the salary differential for nurses could not be attributed to quantitative differences in experience. The situation was different

Table 9. Relation between public health experience and salary of staff personnel in State and local health departments [1]

Service and duration of experience in years	Number supplying information	Percent with stated salary							Mean salary
		$2,000–2,999	$3,000–3,999	$4,000–4,999	$5,000–5,999	$6,000–7,999	$8,000–9,999	$10,000–or more	
Medical	11	0	0	0	9	45	36	9	$7, 900
1–9	6	0	0	0	0	50	33	17	8, 200
10–19	4	0	0	0	0	50	50	0	8, 000
20 or more	1	0	0	0	100	0	0	0	5, 500
Nursing	89	25	65	10	0	0	0	0	3, 400
1–9	61	24	66	10	0	0	0	0	3, 400
10–19	12	25	75	0	0	0	0	0	3, 200
20 or more	16	25	56	19	0	0	0	0	3, 400
Sanitation	69	6	52	17	19	6	0	0	4, 200
1–9	45	7	47	20	20	7	0	0	4, 200
10–19	10	0	60	0	30	10	0	0	4, 400
20 or more	14	7	64	21	7	0	0	0	3, 800
Laboratory	76	14	36	43	4	3	0	0	3, 900
1–9	58	19	40	34	3	3	0	0	3, 800
10–19	14	0	21	72	7	0	0	0	4, 400
20 or more	4	0	25	75	0	0	0	0	4, 200
Health education	13	0	31	61	8	0	0	0	4, 300
1–9	9	0	22	67	11	0	0	0	4, 400
10–19	2	0	0	100	0	0	0	0	4, 500
20 or more	2	0	100	0	0	0	0	0	3, 500
Statistics	21	19	52	24	0	5	0	0	3, 700
1–9	11	18	36	45	0	0	0	0	3, 800
10–19	5	20	60	0	0	20	0	0	3, 900
20 or more	5	20	80	0	0	0	0	0	3, 300
Other	33	15	42	24	9	9	0	0	4, 100
1–9	18	22	33	22	17	6	0	0	4, 100
10–19	11	9	54	18	0	18	0	0	4, 200
20 or more	4	0	50	50	0	0	0	0	4, 000

[1] Includes visiting nurse associations.

for sanitation personnel, however. Only 15 percent of the sanitation workers in State agencies, as compared to 56 percent of those in local agencies, had had less than 10 years' experience in public health.

. As can be seen in table 8, there is a tendency in all the services, except medical and administration, for higher salaries for high-echelon personnel to be associated with longer experience in public health.

Table 9 shows the distribution of staff-level workers in accordance with salary and duration of public health experience. An unexpected finding here is that salary does not increase with increased experience in public health. Actually, in more than half of the services, the staff worker with 20 years' or more experience in public health earns less than the less-experienced individual. This may indicate, of course, that workers who have remained in staff positions for this long period of time have less ability than their co-workers, since, despite their experience, they have been unable to advance in the administrative hierarchy, but there may be other explanations. Only through promotion to a higher rank can the staff worker in a public health agency hope to better his earnings materially.

Summary and Discussion

As a part of the Yale Public Health Personnel Research Project, data on work experience were obtained from more than 600 professional and semiprofessional personnel in State and local health departments and visiting nurse associations in 4 States. Although the data are not of a nature to permit firm conclusions concerning utilization and recruitment of personnel, they do bring to mind several questions that warrant consideration.

Perhaps the most important of the findings were those concerning when and how persons enter the field of public health. Few workers, it was found, entered the field at the beginning of their careers. Chance was one of the three most frequently given reasons for entering public health, whereas formal vocational counseling was mentioned by only 2 of 595 workers.

Can experience in fields other than public health contribute in a significant fashion to the success of the worker in his public health job? If so, public health administrators must make a conscious effort to make maximal use of the past experience of their workers. To what extent is this being done?

If, on the other hand, experience in fields other than public health is not essential nor even beneficial to public health workers, what can be done to alter the situation? The fact that chance played a major role in directing workers into public health certainly indicates a lack of systematic planning for recruitment of public health workers. It would not be unreasonable to assume that recruitment for public health could benefit by serious study and conscious planning.

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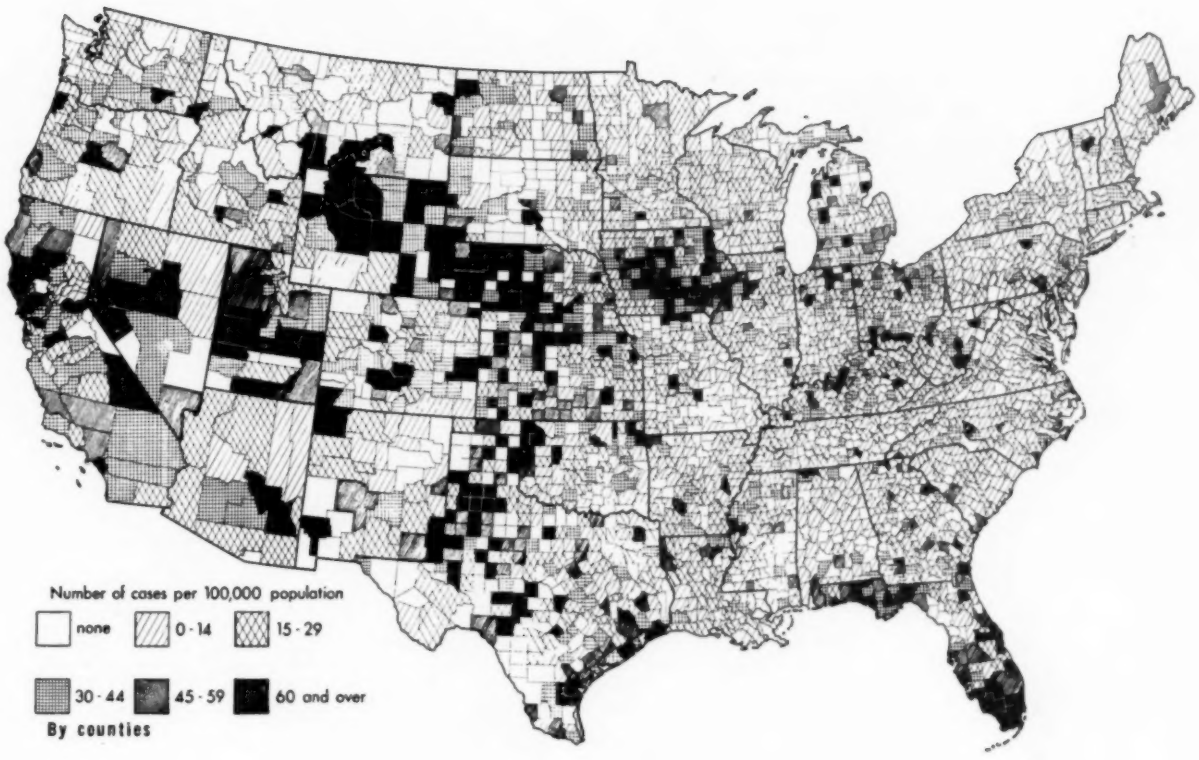


Poliomyelitis in the United States, 1954

The year 1954 marks the end of an era in poliomyelitis incidence in the United States. The era began in 1894 when Caverly investigated and reported upon an epidemic in Vermont. Although there are records of the existence of poliomyelitis in this country prior to 1894, this epidemic apparently was the first extensive one to be recognized. During the following 25 years the etiological agent of the disease was found and epidemiological characteristics accurately described. During this period severe epidemics occurred in various parts of the country, particularly in the decade from 1907 to 1916. Incidence remained relatively low from about 1920 to 1944, when more widespread epidemics began to occur.

Dr. C. C. Dauer, medical adviser of the National Office of Vital Statistics, Public Health Service, prepared this report. His previous annual report on poliomyelitis appeared in the December 1954 issue of Public Health Reports, pp. 1185–1186.

Although various measures, including vaccination, for control of poliomyelitis had been proposed or developed prior to 1954, none was effective. The success of the field trials in 1954 of the most recently developed vaccine may not have an immediate effect in reducing total incidence significantly, but it is a sign of a new era in preventing paralytic effects.

Incidence of poliomyelitis in the United States in 1954 was slightly below the average for the previous 5 years. The death rate remained relatively low, about 1.0 per 100,000 population.

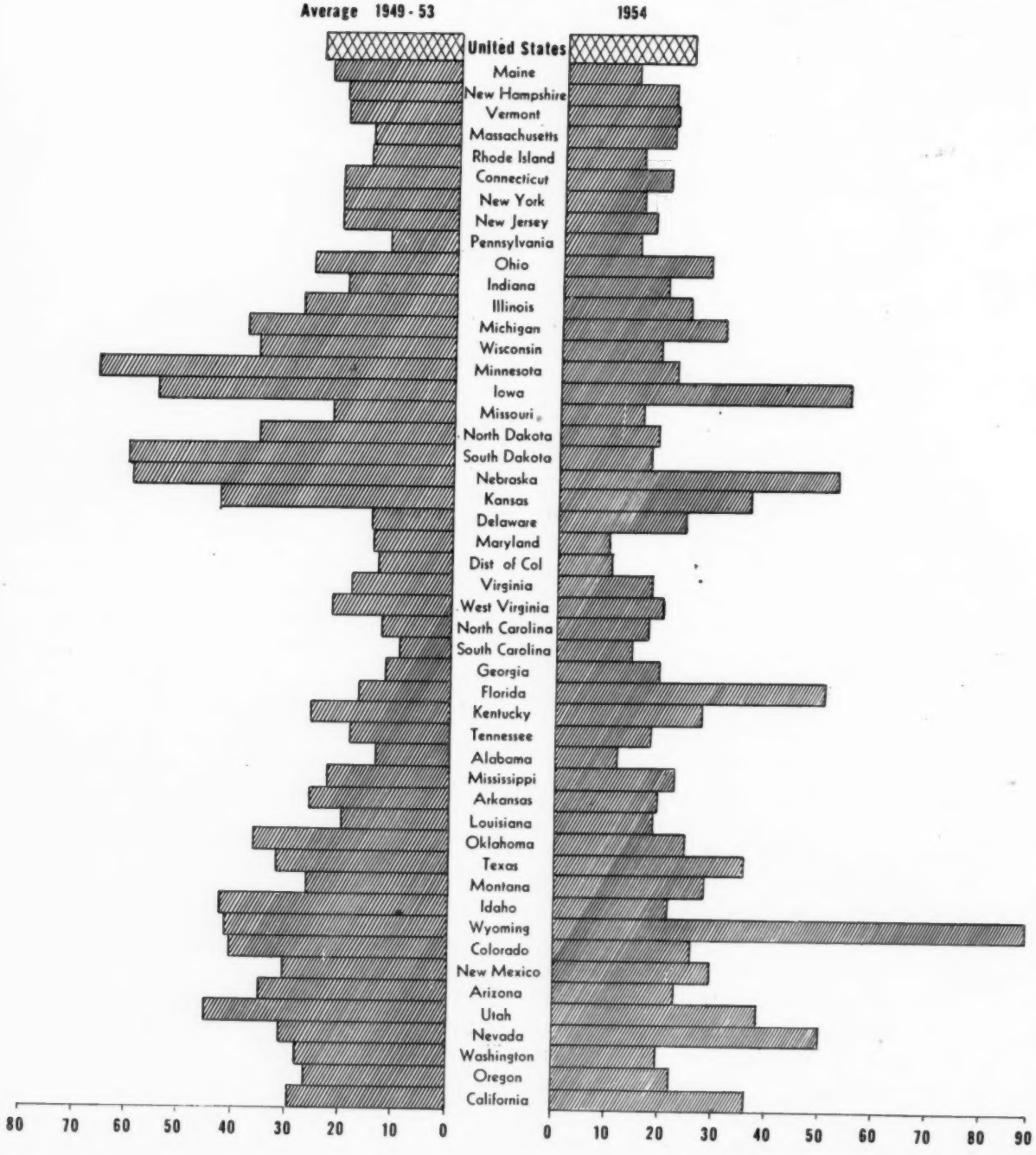
	Number cases reported	*Case rate per 100,000*	*Death rate per 100,000*
1949	42,033	28.3	1.8
1950	33,300	22.1	1.3
1951	28,386	18.5	1.0
1952	57,879	37.2	2.0
1953	35,592	22.5	1.1
Average 1949–53	39,438	25.7	1.4
1954	38,476	23.9	[1] 1.0

[1] Estimated.

The map shows the distribution of poliomyelitis by counties in 1954. Large areas of relatively high incidence, that is, rates in excess of 60 per 100,000 population, were located in Florida, Texas, Iowa, Kansas, Nebraska, Wyoming, Utah, and Nevada. Many smaller areas also experienced high attack rates. Incidence was high in both Iowa and Nebraska in 1952, when western Iowa and eastern Nebraska were part of a larger epidemic area, but these sections had relatively low rates in 1954.

The chart shows the mean incidence or attack rates per 100,000 population for the 5-year period 1949–53 and for 1954. During the 5 years the attack rates were relatively high in the North Central, Mountain, and Pacific States.

Poliomyelitis morbidity rates per 100,000 population in the United States and by State.



In 1954, 5 States had attack rates in excess of 50, and all but 1, Florida, were in the areas where incidence had been relatively high during the previous 5 years. Four other States had attack rates of 30 or more per 100,000 population. The exceptionally high incidence in Florida was due to the occurrence of a large number of cases late in the season, that is, in October. These cases were reported principally in a few counties in the northern part of Florida. A large proportion of cases occurred in adults. Paralysis of varying degrees was reported in 80 percent of the cases in this area. In other States with a high incidence, the occurrence of the disease followed the usual seasonal pattern characteristic of the respective areas.

Of the 38,476 cases reported in 1954, 48 percent were classed as paralytic, 34 percent as nonparalytic, and in 18 percent the type of disease was not specified. The corresponding figures for 1953 were 44, 34, and 22 percent, respectively. There has been a gradual change over the past 5 years with respect to the number reported in the unspecified group. This change indicates that greater efforts are being made to classify cases as either paralytic or nonparalytic. In 1954, 11 States classified all cases as paralytic and nonparalytic, and 5 reported less than 1 percent in the unspecified group. In 1954 only 1 State reported all cases as unspecified in contrast with 17 who made no differentiation of any cases in 1951.

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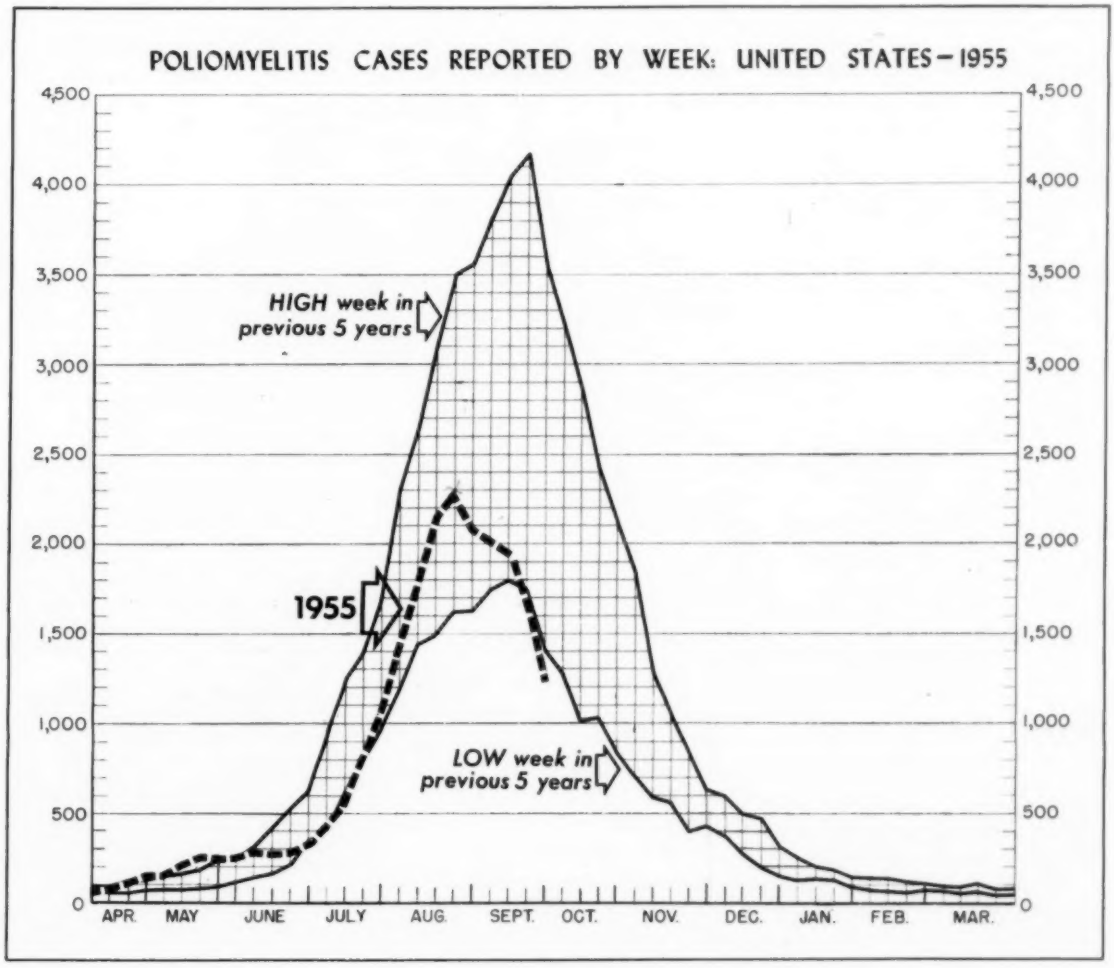

technical publications

Health Manpower Source Book

Dentists

Public Health Service Publication No. 263, section 7, 1955. By Elliott H. Pennell and Maryland Y. Pennell. 159 pages; tables. $1.25.

This seventh section of the Health Manpower Source Book series presents data on the number, characteristics, and distribution of dentists in the United States. Mid-1952 distributions of non-Federal dentists are indicated for several county groupings and for the graduates of individual dental schools by year of graduation and current location of the dentists. The basic material represents enumerations from information supplied for individual dentists in the 1953 American Dental Directory published by the American Dental Association. In addition, United States census data are presented for dentists in the labor force to show trends from 1900 to 1950 and, for 1950, the characteristics of dentist in terms of age, race, sex, employment status, and income level.

Occupational and Related Dermatoses

Abstracts from the literature, July 1943 to December 1953, inclusive.

Public Health Service Publication No. 364. Public Health Bibliography Series No. 32. 1954. By Donald J. Birmingham and Paul C. Campbell. 183 pages. 65 cents.

A continuation of Public Health Bulletins Nos. 266 (1941) and 284 (1944), this publication carries forward abstracts of the literature on occupational and related skin diseases from July 1943 through December 1953. It is intended as a reference for dermatologists, industrial physicians, and others interested in contact dermatoses.

Since practically every branch of industry, including agriculture, has exposures that may produce skin diseases, the volume of the pertinent literature necessitated limiting the articles chosen to representative papers in many subject areas. Wherever feasible the articles have been arranged according to the offending agent.

Staffing the General Hospital, 25–100 Beds

Public Health Service Publication No. 417. 1955. By Margaret K. Shafer. 32 pages; illustrated. 25 cents.

These staffing guides, developed from 1-day data collected in 22 selected hospitals of less than 100 beds, help hospital and health authorities plan health facilities under the Hospital and Medical Facilities Survey and Construction Program.

Charts show number of persons by department for various sized hospitals; hours of nursing care per patient per day; and percent of nursing personnel assigned by shift of service and by size of hospital. Tables further clarify staffing problems.

Sanitary Aspects of the Shellfish Industry of Japan

Public Health Service Publication. Unnumbered. 1954. By L. R. Shelton, Jr., and Richard S. Green. 51 pages; illustrated.

To provide background information for application of the legal responsibilities of the Food and Drug Administration on imports of frozen shellfish, and to advise the Japanese Government on sanitary practices, contributing to the protection of consumers, were the two purposes of this survey, made at the request of the Japanese Government.

The information is particularly helpful to American importers and health officials. Of interest primarily to the Japanese are the recommendations on sanitary practices, most of which are already well-established in the United States.

Spanish Edition of Standard Methods

A Spanish language edition of Standard Methods for the Examination of Water, Sewage, and Industrial Wastes, 1955, will soon be available. The translation was made by Chemical Engineer P. J. Caballero, chief of the water and sewage laboratory in the Ministry of Hydraulic Resources of Mexico.

Its publication on a nonprofit basis has been authorized by the American Public Health Association, the American Water Works Association, and the Federation of Sewage and Industrial Wastes Associations. The Health, Welfare, and Housing Field Party of the Institute of Inter-American Affairs in Mexico is sponsoring the publication of this book at $6. Order accompanied by a draft or check for the exact amount of the order on a United States bank should be addressed to: Dr. Trois E. Johnson, chief, Health, Welfare, and Housing Field Party, Institute of Inter-American Affairs, American Embassy, Mexico, D. F., Mexico.

This section carries announcements of all new Public Health Service publications and of selected new publications on health topics prepared by other Federal Government agencies.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.

The Public Health Service does not supply publications issued by other agencies.

Human Behavior Factors in Program Planning

By ANDIE L. KNUTSON, Ph.D.

TODAY, more than ever before, we need to understand how people act in matters that concern their health and why they behave as they do.

Many of the current problems of public health, such as the chronic diseases—heart diseases, cancer, diabetes, arthritis, blindness—cannot be identified, defined, and solved without the active participation and help of the public. This is true also of the problems of aging, industrial health, mental health, maternal and child care, nutrition, medical rehabilitation, accident control, and the hygiene of housing (*1*, *2*).

If we wish to enlist the active participation of people in public health programs, we need to develop these programs to take care of their problems as they see them or to satisfy the needs they identify. In making decisions we also need to consider what resources people will use, what actions people are willing to take to solve their problems, and the type of health service organization they are ready to accept.

Several factors concerning human behavior seem to deserve further consideration in planning public health programs to meet today's public health goals. While these factors are discussed separately here, they are so closely interrelated and interdependent that in life situations they cannot be isolated, one from another.

Dr. Knutson is chief of Behavioral Studies, Division of General Health Services, Public Health Service. His paper, presented at the annual meeting of the Nebraska Public Health Association, Omaha, September 1954, is published here in somewhat abbreviated form.

Uniqueness of the Individual

Each person is a unique individual. Each is born into society with his own peculiar pattern of biologically determined capabilities, abilities, and characteristics that make him from birth different from every other human being. As this individual develops and grows in his own unique way and in his own special world, he learns through experience particular ways of thinking and acting. These serve in applying the resources he has in taking advantage of opportunities to satisfy his needs and wants.

As he grows, the individual acquires a sense of belongingness or personal identification with specific groups within his surroundings—at first, perhaps, with his family and play groups; later they may include his school and work groups, clubs, union, church, PTA, political party, or professional organization. He becomes identified also as a member of a particular ethnic, occupational, and social group.

As he acquires a strong identification with such groups, their norms and values help to form his norms and values; their interests and wants influence his interests and wants. To a

large extent he adopts their purposes and goals as his own. Yet throughout he remains a unique individual, wanting, hoping, striving for and expecting—yes, and fearing—different things than anyone else. How he acts to apply his own pattern of abilities and talents to achieve his ends is also different in some ways from any other member of his special pattern of groups (*3–5*).

This uniqueness of the individual is of primary importance in public health planning. A person's health is one of the most intimate aspects of his personality. The nature of his concerns is a highly personal matter—so personal, in fact, that he may have difficulty in communicating with anyone about it.

The case finding, diagnosis, and treatment of chronic diseases may be seriously hampered because an individual with symptoms may have had unique experiences that make him afraid to acknowledge the symptoms; or his experiences may have led him to distrust the methods of diagnosis and treatment offered. He may have learned to place greater faith in less scientific ways of dealing with his health problems.

If the groups to which he belongs attach shame or weakness to certain health conditions, he may not be able to acknowledge—perhaps even to himself—that he has such a condition. For social barriers are often more effective motivators than physical force.

Differences Among Communities

A second major factor to consider in planning is that the members of each community also differ as a group in many ways from those of any other community. They differ in the nature and seriousness of their problems, in the extent and quality of their resources, and in the various possibilities they have for action in solving their problems.

They are likely to differ, also, in the pattern and quality of their leadership. While in some communities there may be many effective leaders, in others the leadership may reside with a few appointed or elected officials who may exert their control through a wide variety of groups. In some communities, nearly all the major decisions are made by one individual or by persons directly responsible to him.

The methods of communication available to members of different communities also vary so that no single means of communication can be assumed to be effective everywhere. The channels of communication available in a metropolitan center may include newspapers, theaters, radio, television, churches, political organizations, and a wide variety of similar formal media. In addition, many informal channels, such as discussions in informal gatherings or neighborly gossip at the corner drugstore or post office, may serve as channels of communication. On the other hand, people living in a rural community may lack many of the formal means of communication. They may depend more upon the informal methods—in fact, these informal means may in some instances be developed to the extent that they are even more effective than the formal channels of the metropolis. Do you recall the use once made of the old party line? Very little happened in the community without everyone knowing about it.

Communities also differ in the way the citizens prefer to organize to solve their problems. Citizens of an industrial community, for example, are likely to prefer patterns of organization different from those prevailing in an agricultural community. This is especially likely if the resources and qualified personnel differ in the two areas. If a rural area lacks the equipment and personnel needed to diagnose certain health conditions, it may be necessary to transport the patient to some central clinic or hospital. Or, in the absence of adequate medical facilities, individuals in the rural community may be forced to lean more heavily on the limited facilities that are available.

It is not always possible to interest the members of all communities in the same type of actions, even though similar problems may exist. People living in a community which has a very narrow margin of security cannot afford the same approach as those residing in a community that has more economic security. If the people of a community have undergone serious economic hardships in the past, its leaders are likely to be cautious in accepting long-range responsibilities that may threaten their future economic security. For example, the leaders of a community that now lacks a local health unit may honestly feel that they cannot

afford such a unit, even though it would seem to the outsider to be well within their means. Even though it may seem within their means today, they may fear that they will not be able to afford it tomorrow, or at some future date.

The members of different communities vary in the way they adopt new programs. In most areas of our country we moved gradually from crude railroads and steam engines to a modern railroad system and then to air transportation; from horse and buggy and dirt roads, to early models of automobiles; and finally to a modern highway system and streamlined cars. This pattern of developing a transportation system has not been the same for all communities. People in some areas have changed almost directly from ox carts to air transportation (*6*).

Members of certain communities now lacking adequate public health services may prefer to start with some other type of service than that the public health people consider basic. They may consider their present means of dealing with these basic public health problems adequate and consequently, may prefer to maintain the type of organization that is now set up for handling such problems, even though professional workers consider this organization inadequate. Some of the lay leaders may be more concerned about providing solutions to newer problems of public health than they are about providing the traditional basic health services. If this is true, they might move more quickly into the development of programs concerned with problems of the aging population, mental health, accident prevention, or the chronic diseases—in short, their primary concern may be with problems that many existing health departments are just beginning to identify as public health problems.

If this situation exists in some communities now lacking adequate public health services, public health leaders might find it easier to develop effective public health organizations in these communities by starting in the direction community leaders identify as being of concern. As these leaders become better acquainted with public health, they will be better prepared to consider ways of dealing more effectively with the problems public health leaders consider more basic.

Public Concern

A third major factor to consider in planning public health programs is that the people of the community need to recognize a problem and need to feel concerned about it before they are likely to take steps to solve it. Therefore, unless the problems, interests, or wants of the public are adequately identified and the public health program developed in terms of these, the public is not likely to be a willing participant in supporting and carrying out the program.

The matter of determining the public health problems in a community is, of course, basic to determining the kind of organization needed and the types of methods required to solve the problem. But the very process of determining public health problems with which the members of the community are faced from their point of view is beset with difficulty.

We must see that our questions or approaches do not limit the responses to our own ideas about problems or possibilities. This applies no matter what technique is used to identify problems or wants—questionnaires, interviews, projective tests, group discussions, or statistical analyses.

We are not likely to get an adequate and valid answer from the layman, for example, if we ask him to tell us about his public health problems or his public health needs. A man cannot report what he does not know or perceive. Unless he knows much more about public health than you or I did when we first entered this field, he will not be able to give an informative or meaningful answer to such a question. If the layman has any knowledge of public health at all, it is likely to be limited to what he has personally experienced. To a farmer, public health may mean milk inspection; to a parent, public health may mean what the school nurse does.

The fact that we are earnestly seeking to identify public health problems does not necessarily mean that we will be able to see them when they are presented to us. In any situation where professional and lay persons seek to cooperate, the differences in their patterns of thinking and perception are serious barriers to effective communication. At times, our professional patterns of thinking will prevent us from seeing the very thing we are seeking.

Johnson reports an incident which clearly illustrates this (7). A child with a persistent cough had his throat X-rayed for diagnosis. The radiologist reported there was nothing in the X-ray to show why the child was coughing. The cough persisted and the child returned to have another X-ray taken. Now, the shadow of a button was seen in the throat region. The button was removed and the coughing stopped. When the first X-ray was reexamined, the shadow of the button was seen there also but it had not been identified by the radiologist, who had assumed that the child had been X-rayed with his clothes on and that the button was on his shirt. The radiologist had failed to see the significance of the button for the problem at hand—that is, the diagnosis of the cause of the cough—because the other explanation seemed more reasonable. His perception had been in accord with previous experiences and was completely logical.

Close cooperation between the layman and the professional person is essential in identifying public health problems and the desires of the people of the community for action. Since representatives of the two groups are likely to identify different things in the same situation, two different patterns of problems and needs are likely to be developed when both are involved, perhaps at first independently. As these two patterns of problems are defined, both groups must join together for discussion in order to identify those on which there is common agreement and also to explore reasons for disagreement on others.

The layman on the one hand must acquire a better understanding of those problems and needs, identified by the professional person, that are so much concerned with his welfare. Unless the layman understands the need for some of the surveillance operations, such as immunization or milk and water control, he is not likely to give the public health person the support required to carry out programs of this type.

On the other hand, the public health person must recognize and understand those problems and concerns of the layman which may not at first glance appear to be within the scope of the established public health responsibility. If the layman places a high value on a medical reference service, a child accident prevention program, recreation facilities for teen-agers, or prenatal care and well baby clinics, he is going to insist that action on these requirements be taken by someone.

Seeing the Solution

A fourth major factor to consider in program planning is that people are most likely to take a particular action when they see that action as one that will adequately solve their problems or satisfy their concerns.

People who see false teeth as the best solution for bad teeth are not likely to take adequate steps to preserve the teeth they have. Rather, they may look forward to getting rid of their teeth and substituting false teeth for them. Conversely, those who see fluoridation of the water supply as a good way to prevent dental caries in children and are concerned about it, perhaps, because they have children of their own, are most likely to support a community fluoridation program.

One would not expect the community leaders who do not see a need for local health units to seek assistance in developing such units. Even though they may recognize serious public health problems, they will not try to organize local health units unless they believe these units will be able to cope with these problems.

Opportunity for Action

Fifth, an opportunity for action must exist, and this opportunity must be perceived as both existing and possible. People must perceive the action as one they are both physically and psychologically able to take. For example, if the action involves attending a clinic, they must perceive the clinic as one they can get to at a time that does not interfere with their work or other essential activities. They must also see the clinic as one they are entitled to go to and one at which they feel welcome.

A person whose teeth are decaying may perceive the cost of repair as prohibitive even though it is possible to obtain adequate care at a price he can afford within the community. If he believes the cost is prohibitive, he is not likely to act, no matter what the situation actually is. By the same token, community leaders

may object to certain local programs. Even though they may appreciate the need, they may not agree that the proposed program is a reasonable possibility considering the resources they have available to them. If this were their perception of the situation, they might strongly oppose such a program as being unrealistic and seek some more meaningful way of satisfying their needs.

They might ask: "What is the use of talking about such a program when we simply don't have the funds, and we have no means of attracting the necessary personnel at the salaries we can pay? Isn't there some other way we can handle this problem? Would it be a good idea to make improvements in the way we are now handling it rather than trying something new that we won't be able to carry out?"

Any new services or organization developed within a community must also fit in with other programs going on in the community. If a service conflicts with such programs, its chances for success are more limited.

Meltzer found that community leaders must feel that a new program will help them in achieving their own objectives if they are to support it (*8*). Community leaders are not likely to give enthusiastic support to any program perceived as interfering with some of the things they personally wish to do or which they identify as responsibilities of their own organizations.

Thus, any action to be taken must not only be seen as possible but must also be seen as an action that does not conflict in any way with personal or group values of the people concerned. It is futile to urge the orthodox Hindu to boil the holy water of the Ganges to kill germs when his religion tells him not to boil holy water and not to kill anything. Likewise, it is useless to urge the orthodox Jew to serve milk to his children at all meals when this conflicts with his strict code which prohibits serving meat and dairy products at the same meal.

A midwestern farmer who places great value on his endurance and thinks it is sound practice to work off his indigestion after a heavy meal is likely to ridicule the idea of staying in bed with similar symptoms that may be related to a heart condition. If he takes pride in how healthy his children look, he may consider their going for regular physical examinations or X-rays a sign of weakness in the family. It does not tie in with his frequent boast, "I've never been to a doctor in my life!"

A low-income family which identifies the public health clinic as a charitable type of organization and objects to the idea of accepting charity is not likely to patronize that clinic. It will not help much to tell them that the clinic has been designed to serve them and that they are welcome. The way they perceive it is the important thing.

By the same token, a community program must be organized in accordance with the customs and values of the community. For the customs and beliefs prevailing in a community are most effective forces in determining the types of actions the people of that community will take and the types of actions they will reject.

As Dorolle (*9*) has observed, "When we set about improving a people's health, we must put aside our own concepts of good and evil, better and worse, and not encroach upon the people's beliefs and cultural concepts. Everyone has the right to develop his own philosophy and to refuse any change in it which does not come from within himself; furthermore, it is useless to attempt to impose changes in cultural concepts from the outside. If such changes are imposed, they cause disequilibrium and misunderstanding which seriously compromise the work which is being attempted."

Patterns of Behavior

The final point I would urge you to consider in planning public health programs is concerned with the patterns of thought and behavior of people. The action to be carried out must be consistent with the usual patterns of thinking and acting of the people concerned.

Few of us are willing to take the time and possibly suffer the embarrassment of brushing our teeth immediately after the noon meal every day, even though we may believe the dentist who advises us that this is a desirable practice. Likewise a workman with a heart condition is not likely to take a rest period in the morning or afternoon as recommended by the doctor if he feels that doing so may cause him to lose

his job. Nor is such a workman likely to take time out for the free X-ray service offered him if he thinks there is a possibility that positive findings will lead to his discharge from work and complete disruption of his family life.

Foster has pointed out that the failure to treat sick children was one of the most bitter criticisms leveled at the public health centers in South America. "It illustrates a failure of the people served to understand the fundamental difference between preventive medicine . . . and routine treatment of the sick and ailing" (*10*).

The results of preventive medicine are often more difficult to perceive than the results of clinical medicine. From the standpoint of the family, the distinction we make as professionals may not be as real or understandable as we sometimes assume. It is likely that some people in our own country also fail to distinguish between prevention and cure and thereby have difficulty understanding the need for separate types of organizations and services. Further exploration of this possibility may be most fruitful.

In brief, then, the remarkable success the public health team has achieved in solving the problems of the communicable diseases and environmental sanitation has resulted in more adequate control of many of these problems. Today, more of the problems of public health can only be identified, defined, and solved with the active participation and help of the public. Fortunately, the public today is better educated, better informed, and better able to participate in the solution of such problems.

A colleague in the American Psychological Association has drawn an analogy about psychology which may have some meaning to public health. He has called attention to tremendous changes that have occurred in the theory and concepts of psychology and the implications this has for research and program. This challenges us to review our tools and to recognize that many of them which were developed to test the hypotheses of a quarter of a century ago are not adequate to explore modern concepts.

Solving the new problems of public health may also require new tools. In some instances completely new approaches may be required to keep pace with the phenomenal rate of achievement of the period through which we are passing.

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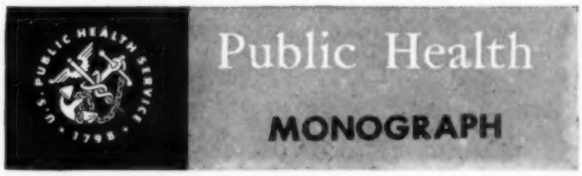
PHR

Disposition of First Admissions to a State Mental Hospital

This study of the experience of the Warren State Hospital, Warren, Pa., during the period 1916–50 has several purposes. The first is to acquaint epidemiologists, health officers, and other public health workers with some of the complex problems faced by mental hospital administrators in treating the increasing number of patients admitted to and resident in mental hospitals and in determining what happens to patients following admission. The second is to demonstrate a method for studying the flow of patients through the mental hospital and to apply this method to a study of changes in the rates at which first admissions to Warren State Hospital have been returned to the community or have died in the hospital. The third is to dispel the idea that the prognosis of patients committed to mental hospitals is hopeless. The fourth is to use the results of this historical study as a background for discussion of some basic epidemiological and clinical research needed to assist in the interpretation of the findings and in the formulation of public mental health programs directed toward care, treatment, and prevention of mental illness and disability.

A statistical analysis was made of the records of 15,472 first admissions to Warren State Hospital during the period 1916–50 to obtain an answer to the question, What has been the trend in the probabilities of separation from the hospital, either alive or dead, within specified periods following first admission for patients of specific age, sex, and diagnosis?

Patients were followed from the date of their first admission to the date of their first significant movement out of the hospital, defined as follows: the date of first release to the community on direct discharge or to convalescent care, whichever came first, or the date of death in the hospital. The date of placement on convalescent care was selected as an end point for this study because it represents a critical point in the life of the patient, when the staff agrees that once again he is ready to return to the community and to live outside the environs of the hospital.



No. 32

The accompanying summary covers the principal findings presented in Public Health Monograph No. 32, published concurrently with this issue of Public Health Reports. The authors are with the National Institute of Mental Health, Public Health Service, Bethesda, Md., and the Warren State Hospital, Warren, Pa.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and major universities and in selected public libraries.

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Kramer, Morton; Goldstein, Hyman; Israel, Robert H.; and Johnson, Nelson A.: A historical study of the disposition of first admissions to a State mental hospital. Public Health Monograph No. 32 (Public Health Service Publication No. 445). 25 pages. Illustrated. U. S. Government Printing Office, Washington, D. C., 1955.

Four periods were selected in which to describe the movement of patients: 1916–25, a period before the introduction of any major treatment program; 1926–35, when Warren State Hospital began to lay heavy stress on industrial and occupational therapy for all patients; 1936–45, a period in which some of the therapies in use were standardized and other new therapies were introduced; and 1946–50, when the medical staff was enlarged considerably, and when there was intensified use of electroshock and group and individual psychotherapy.

Some of the conclusions of this study and the questions they lead to are:

1. Of patients admitted to the hospital during 1946–50, a larger proportion were released within 1 year following admission than the proportion admitted during 1916–25 who were released within 5 years following admission. In all periods, at least 50 percent of the patients were released within 5 years following admission. The youngest patients, those aged 15–34 years, have extremely high probabilities of release. Patients 75 years old and over have small chance of ever leaving the hospital.

2. For patients with functional psychoses, the probability of release in the first year following admission in the period 1946–50 was considerably in excess of the probability of release for patients admitted in each of the earlier periods.

Does this mean that the various therapies used in increasing volume in the most recent period—electroconvulsive therapy, insulin, group psychotherapy, and occupational therapy—have been responsible for this increase in release rates, or have other factors been responsible?

3. Patients with senile and cerebral arteriosclerotic psychoses have low probabilities of return to the community. Their death rates, particularly in the first few weeks and months following admission, are exceedingly high.

What are the social, economic, and familial factors responsible for bringing a high proportion of moribund patients into the mental hospital?

4. Functional psychotics, as well as other categories of patients not released in the first year of hospitalization, experience considerably reduced probabilities of release in the second and subsequent years of hospitalization. Also, patients admitted during 1946–50, who have attained their second and third years of hospital life, have approximately the same chances of being released in the following year as had similar groups of patients in the earlier cohorts of admission.

What are the etiological and other factors responsible for long-term hospitalization? What treatment methods can be developed to make it possible to return more of these individuals to the community? What can be done to improve the lot of the patient who cannot be returned to society?

PHR

Appraising Fly Control Programs

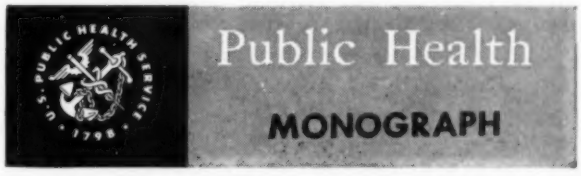
Since 1946, the effective use of chlorinated hydrocarbon insecticides in the control of the housefly, *Musca domestica*, and of various species of blowflies (*Phaenicia sericata*, *Phaenicia pallescens*, *Phormia regina*) has led to the establishment of community fly control programs throughout the United States. Experience has shown that successful fly abatement requires a composite approach which includes the development of adequate levels of environmental sanitation, chemical control, community education, and biological evaluation.

The evaluative phase is the subject of this monograph, which discusses the techniques per se and as each is applied in field operations. Most of the data illustrating the advantages and disadvantages of the methods relate to community fly control programs sponsored by the Communicable Disease Center in cooperation with State and local health departments during the period 1948–53.

The evaluation of a community fly control program serves to guide the selection and frequency of the measures employed and to assay their effectiveness. The latter function requires a routine, periodic assessment in contrast to the flexible, variable techniques necessary for guiding the control operations.

The three methods used most commonly to determine adult fly densities are the grill, reconnaissance, and fly-trap techniques. Either the Scudder grill or a reconnaissance type of survey based on the grill provides the most acceptable means of obtaining repeatable, reliable indexes to fly abundance.

For effective surveillance of a municipality, the city should be divided into areas of socioeconomic levels, such as business, high-class residential, and so on, and the sampling coverage should be related to the magnitude of the fly problem within the zone concerned. Evaluation units of 10 to 20 blocks each are established for grill surveys, 1 to 2 blocks in each unit being inspected weekly. Three types of station blocks are designated: fixed block (block with highest fly potential within the evaluative unit); random block (any block within the evaluative unit except the fixed station block); and problem block (block with extremely high fly potential,



No. 33

The accompanying summary covers the principal findings presented in Public Health Monograph No. 33, published concurrently with this issue of Public Health Reports. The author is with the Communicable Disease Center, Public Health Service, Savannah, Ga.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and of the major universities and in selected public libraries.

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Schoof, H. E.: Survey and appraisal methods for community fly control programs. Public Health Monograph No. 33. (Public Health Service Publication No. 443.) 18 pages. Illustrated. U. S. Government Printing Office, Washington, D. C., 1955.

resulting from the presence of a dairy, abattoir, dump, and so on).

Survey data show that prevalence trends for fixed station and random station blocks are similar. However, random station blocks are much slower in responding to any sharp increase in fly prevalence. Because the fixed station block is a more sensitive indicator of the fluctuations in fly densities, it is preferred for operational programs.

Fly traps are less reliable than grill surveys in depicting quantitative trends but give a broader index to the qualitative aspects of the the fly population.

The appraisal phase of a community fly control program must be considered as an integral part of the whole operation. Effective utilization of appraisal methods contributes to more efficiency and economy and, in turn, supports the health of the community.

PHS films

Organized Mosquito Control

16 mm. Film, color, sound, 17 minutes, 1955.

Audience: Public health workers and others interested in mosquito control.

Available: Loan—Public Health Service, Communicable Disease Center, 50 7th St. NE, Atlanta 23, Ga.

The solving of mosquito problems on an organized basis is depicted in this film.

Sampling as a first step to determine species present, relative abundance, and types of breeding places are portrayed, as well as dipping for larvae to determine major problem areas, and the spraying of breeding places. Breeding sites are surveyed as determinants of flight ranges.

Three common methods of mosquito abatement are outlined—permanent control through water management, larviciding, and killing adults on the wing or in resting places. In addition, five major types of problem areas—fresh water swamps and depressions, salt marshes, lakes and farm ponds, irrigated fields and pastures, and urban areas—are illustrated. The hydraulic dredge at work, larviciding, and hand and power spraying are shown also.

An efficient manager, adequate funds, capable employees, suitable equipment, and up-to-date records are pointed out as contributing to the success of an organized mosquito control program.

Mosquito Stages of Plasmodium falciparum

16 mm. Film, black and white, sound, 10 minutes. 1954.

Audience: Medical, public health and parasitology students, sanitarians and laboratory technicians, and others interested in the study of living malaria parasites.

Available: Loan—Public Health Service, Communicable Disease Center, 50 7th St. NE, Atlanta 23, Ga.

The appearance and behavior of living malaria parasites within the mosquito host are shown in this film. It depicts the female *Anopheles quadrimaculatus* obtaining a blood meal and the action of the mosquito mouth parts within tissues.

Gametocytes, gamete formation, and fertilization are observed, along with the development of the ookinete, oocyst, and sporozoites. Transfer of sporozoites to the salivary glands and their inoculation into the tissues of the host when the infected mosquito feeds are likewise viewed.

This is a companion film to M 138a "Erythocytic Stages of *Plasmodium vivax*."

Mosquito Prevention in Irrigated Areas

16 mm. Film, black and white, 7 minutes. 1955.

Audience: Public health workers interested in mosquito prevention in irrigated areas.

Available: Loan—Public Health Service, Communicable Disease Center, 50 7th St., NE, Atlanta 23, Ga. Purchase—United World Films, Inc., 1445 Park Avenue, New York 29, N. Y.

That it is possible to achieve irrigation without the problem of mosquitoes is demonstrated in this film. It emphasizes that the one cardinal rule for controlling mosquitoes in irrigated areas is to avoid standing water by careful design and maintenance of the irrigation system, by accurate preleveling of fields, and by providing adequate runoff drainage.

A cement water-drainage canal.

The life cycle of the mosquito is shown, and 13 typical locations of stagnant pools or sluggish water where mosquitoes might mature in irrigated areas are illustrated.

APHA WESTERN BRANCH CONFERENCE REPORT

The 22d annual meeting of the Western Branch of the American Public Health Association, attended by 450 representatives from 11 Pacific and Mountain States, 3 western Provinces of Canada, Alaska, Hawaii, and the Philippine Islands, was held in Phoenix, Ariz., April 19–22. Of the papers presented at the meeting, 1 is published in full and 7 others are briefed. Some of the papers are scheduled for publication in full at a later date in *Public Health Reports* or in other scientific and professional journals.

The newly elected officers of the branch are: president—G. D. Carlyle Thompson, M.D., executive officer and secretary, Montana State Board of Health, Helena; president-elect—A. Harry Bliss, associate professor and chairman, department of public health, University of California, Los Angeles; vice presidents—Mrs. Christie T. Corbett, generalized nursing consultant, Oregon State Board of Health, Portland; Robert Dyar, M.D., chief, division of preventive medical services, California State Department of Public Health, Berkeley; J. A. Kahl, M.D., acting State director of health, Washington State Department of Health, Seattle; secretary-treasurer—Mrs. Amy Darter, supervising bacteriologist, division of laboratories, California State Department of Public Health, Berkeley.

The branch will meet next on May 30–June 2, 1956, in Salt Lake City, Utah.

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The Epidemiologist Looks at Smog

By LESTER BRESLOW, M.D., M.P.H.

ORDINARILY, the epidemiologist is confronted with a disease and is asked to determine its source or cause. In the case of smog, he is given an environmental condition and asked to determine whether this causes disease.

When the epidemiologist investigates a particular illness, his first task is to define the illness and its occurrence in time and place. Likewise, when he attempts to ascertain whether smog has deleterious effects on health, the first task is to define smog and its occurrence in time and place. Here the difficulties begin.

Air is perhaps our most taken-for-granted natural resource. During the past several decades, however, city dwellers have become aware of industrial and other air-polluting wastes. Occasionally, as in London, England, in 1952, Donora, Pa., in 1948, and Meuse Valley, Belgium, in 1930, the pollution has become severe enough to result in sudden death to large numbers. A vague apprehension, supported by some evidence, is also arising that prolonged exposure to moderate air pollution may cause insidious, harmful effects or even premature death.

For none of the air pollution disasters mentioned has there been a convincing identification of the substance responsible. Although some investigators have incriminated sulfur dioxide as an important factor, the evidence is scanty. So when the epidemiologist is called upon to find whether the polluted air of an urban community such as Los Angeles is injurious to health, he really has no good chemical guidelines to pursue. We know that air pollution can kill, but we do not know what substance or combination of substances may be responsible.

In Los Angeles, the people have been increasingly concerned with eye-irritating properties of the air, the loss of visibility, and damage to plants. Smog in Los Angeles is even defined as the quality of air which produces these effects. Thus, a search has been initiated to determine what air pollutant causes eye irritation, decreased visibility, and plant damage. The substantial progress in this direction, however, does not materially aid the epidemiologist who is concerned with more serious effects that may be occurring. The materials which cause eye irritation, for example, may not be the same as those which cause other types of injury to health. Dozens of substances have already been found in the Los Angeles air, and many of these measured. The fact that certain of these are being identified as the factors causing eye irritation does not help to determine whether air pollution in Los Angeles can cause respiratory disease or death. Quite different pollutants may be involved in the latter if they occur.

One might assume the eye-irritating substances to be indexes of air pollution in general. By determining and measuring these substances, we would acquire knowledge on the degree of pollution from any and all substances. This assumption may be highly misleading. For example, the eye-irritating substances appear to be largely dependent upon sunshine. In the event of severe air pollution coincident with severe fog, as in the London episode, the

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Dr. Breslow, chief of the bureau of chronic diseases, California State Department of Public Health, San Francisco, presented this paper at the April 1955 meeting of the Western Branch of the American Public Health Association. Other papers from the meeting follow in brief form.

substances, which are dependent upon solar radiation, might fail as an index at the very time they were most wanted.

Thus, the epidemiologist cannot be content with definitions of smog which are commonly accepted today. He must keep in mind the whole array of air pollutants—lead and other heavy metals, chlorinated hydrocarbons, and many other substances which have been relatively neglected in the attempt to determine the eye-irritating and plant-damaging substances in smog.

Not only do we have trouble defining smog, but we are beginning to realize its tremendous variation in place and time. The soot pollution of certain cities in the eastern United States is vastly different from the pollution of California cities with hydrocarbons and other types of waste. In any one community, for example Los Angeles, the air pollution as reflected in the chemical measures now available differs greatly not only from day to day but even from hour to hour, depending upon meteorological and other factors.

A Two-Part Problem

However crude his notion of the nature of smog, the epidemiologist still faces the question, does it cause ill health or death? This problem may actually be divided into two parts: (*a*) Does it cause immediate damage, that is, within a few hours or days; (*b*) does it cause long-range damage, after exposure for years and years?

To answer the first question one turns naturally to the usual indexes of ill health—excessive mortality, morbidity, and disability. Do any of these occur during or immediately after episodes of smog? At this point, of course, we come back to the vexatious problem, what is an episode of smog? For purposes of our initial investigation of the effect of air pollution on health we had available the results of an aerometric survey conducted by the Air Pollution Foundation at 10 stations in Los Angeles during the months of August through November 1954. We arbitrarily defined an episode of smog as a series of days during which several of the following were noted: Air pollutants such as lead, oxidant, nitrogen dioxide, hydrocarbons, and carbon monoxide were recorded as present in "high" amounts; adverse meteorological conditions prevailed; and newspaper accounts indicated smog. The records unfortunately did not cover all days during the 4-month period, and correspondence between the various measures actually made was far from perfect. However, inspection of the data did permit the crude selection of three periods of relatively high smog—one each in September, October, and November 1954.

Air pollution disasters characteristically have affected most severely the elderly, and especially those with chronic cardiorespiratory diseases. Hence, our first thought was to determine if smog episodes resulted in excessive frequency of mortality from selected cardiorespiratory diseases among older people. No such effect from the three smog episodes could be found for the Los Angeles population 65 years of age and older. This failure to show any effect on mortality among those 65 and older may be contrasted with a very obvious effect on the mortality of this group by daily temperature fluctuations, which we did note. Further work is being done on this question of deaths among older persons, with particular attention to mortality among those more than 75 years of age and mortality for the several days following the last episode of smog which occurred at the end of November. Analysis up to the present time includes only deaths occurring in November.

We also examined the mortality experience of a group of frail, elderly individuals, such as those found in nursing homes. Sixteen Los Angeles nursing homes with a total of 358 beds reported the number of patients who died each week during the months of August through November 1954. One week of this period, the week immediately following the heavy smog of late October, did show an unusually large number of deaths. However, since the data cover only a limited period, not much significance can be attached to this observation until more work is done to determine whether corresponding rises occur during other episodes of smog.

Inspection of the infant mortality experience during the 4-month period of the aerometric survey gave no indication of any effect from air pollution.

Thus, only the barest suggestion was found that Los Angeles air pollution, during the fall of 1954, actually caused mortality.

In respect to morbidity we studied the findings of a household sickness survey which was being conducted throughout the State by the State health department. Preliminary inspection of the rates for respiratory illness and for illness among older persons in Los Angeles has not revealed any measurable effect from smog during August through November 1954.

If air pollution adversely affects the cardiac and respiratory systems, the proportion of persons admitted to hospitals with certain diagnoses might reflect this relationship. Examination of admission data for more than 29,000 patients in 9 large Los Angeles hospitals during the 4-month period showed no changes in the proportion of persons admitted with cardiac or respiratory diseases which were coincident with smog.

Limited data on industrial and school absenteeism revealed no relationship to the periods of smog.

Examination of available indexes, both mortality and morbidity, did not yield much evidence of a measurable effect on health from Los Angeles air pollution during the fall of 1954. This, of course, is not to say that no effect occurred. It may be that our measuring rods are too crude.

The opinions of Los Angeles physicians, expressed in a mailed questionnaire submitted by the county medical association, overwhelmingly support the idea of an adverse effect by smog upon health. A telephone survey of school administrators and teachers by the Los Angeles Board of Education during the October 1954 smog episode indicated a strong belief that smog was interfering with children's behavior and school performance. The pupils were said to be restless, irascible, and less attentive. Although not quantitative, this type of opinion evidence deserves some attention, if only to indicate the direction of more definitive studies.

Long-Term Effects

The foregoing discussion pertains only to part of the question, namely the immediate effects on health. Even though no such effects are measurable, and this cannot yet be stated, one must still consider the question of long-term effects. How does health respond to smog exposure continued year after year? Are there any chronic effects, perhaps of greater import than acute effects? This is a much more difficult question.

Stocks (*1*) has advanced some interesting evidence that air pollution in English cities may induce various lung diseases including lung cancer. He was, of course, dealing with relatively stable populations, for the most part exposed to one type of air pollution during their entire lifetimes. What may be the long-term results of the tremendous migration to Los Angeles during the past 10 years when air pollution of a different sort from that in England has apparently been increasing? The answer may be several years delayed, but the question is one we cannot ignore.

At least two approaches to the problem of chronic effects may be useful. One is to compare the mortality and morbidity experience of Los Angeles residents with some control group, for example, the residents of another California city. It is difficult to select a satisfactory control group, particularly because of the migratory habits of the population. Another approach is to compare the health experience of Los Angeles residents who have lived in the community only a short time with the health experience of those who migrated there many years ago, and who, consequently, have had longer exposure to Los Angeles air pollution.

Both of these approaches are now under consideration, in addition to further study of the possible immediate effects of air pollution.

In addition to the question of whether smog causes disease, particularly a measurable effect on morbidity and mortality, the epidemiologist may also be asked a related but somewhat different question, namely, is smog a health hazard? To this one may give an unequivocal answer—yes (*2*), because of its obvious immediate interference with the physical, mental, and social well-being of the people; its possible, but as yet undetermined, cumulative adverse effects upon health; and its disaster-making potential, should pollution concentration build up in any area.

REFERENCES

(*1*) Stocks, P.: Regional and local differences in cancer death rates. General Register Office studies on medical and population subjects No. 1. London, His Majesty's Stationery Office, 1947.

(*2*) California State Department of Public Health: Clean air for California. San Francisco, The Department, 1955.

State Health Councils

PHR brief

The merits and deficiencies of statewide health councils are of considerable current interest to health officers.

These councils are a means through which public health problems may become known and understood and through which citizen support and appropriate, cooperative action may be achieved.

Sound guidance for all health councils is found in the words of Dr. Florence R. Sabin: "Give the people the facts and they can be depended upon to act." That thought guides the public health servants of Colorado in their efforts to promote dynamic health leadership for the entire State.

Nature of State Health Councils

To describe the composition and objectives of numerous State health councils, let us start with a broad definition. The health division of the Denver Area Welfare Council defines a health council as a State or local federation of groups and individuals organized to plan and jointly promote health activities.

State health councils are now functioning in nearly two-thirds of the States. Usually, according to reports presented to the annual meeting of the National Health Council in 1952, a State council's membership includes statewide organizations primarily concerned with health or medical services. These include medical and other professional associations in health fields, hospital associations, official health agencies, and voluntary health agencies. Membership may also include interested statewide organizations not directly dealing with health and medical matters. Often the latter type of organizations are associate members of the councils. They should be considered very important, since they show potentialities of being the best channel through which to develop widespread public interest in health needs and activities.

Local health councils are frequently included as associate members of the State councils. In any case, there should be close working relationships with the local councils and periodic State meetings attended by representatives of all the local councils. There are now in the United States about 700 local health councils and 250 health divisions, or committees, that are units of larger community organizations dealing with many civic improvement projects.

Some of the State councils charge annual membership fees; others, including the council in Colorado, leave the amount contributed to the decision of each member organization. Occasionally, a State council has a paid executive director and staff; in other instances, as in Colorado at present, the council's work must be carried forward through services donated by member organizations and, possibly, a paid stenographer or clerk. Necessarily, therefore, the nature and the costliness of the programs that can be undertaken by the councils differ.

In considering possible principal objectives, the following appear to be common to most of the State councils:

1. To educate the council members regarding programs and policies of the member organizations.

2. To serve as a State information center on health programs and problems.

3. To encourage joint planning among health organizations in order to eliminate gaps and overlapping in their programs.

4. To determine statewide health needs, arouse public support for proposed health programs, and promote needed health legislation.

5. To assist in the organization of local health councils, and to guide and encourage

By R. L. Cleere, M.D., M.P.H., executive director, Colorado State Department of Public Health.

them in studying local health needs in relation to State programs.

6. To further local health units and other needed local health programs.

Health Council in Colorado

The accomplishment of health council objectives requires skill in public relations and community organization, a skill possessed in rare degree by Dr. Sabin. A few of her words, taken from a speech in 1950, serve to explain the purpose behind the Colorado Health Council: "We are interested in the organization of permanent health councils on a State basis, with a membership of representatives of all the private health agencies who wish to join. Such an organization is intended to maintain the interest of citizens in aiding, following, and giving constructive criticism and advice to all the governmental agencies."

The Colorado Health Council was organized and incorporated in 1950. Its future seemed assured by more than 20 member organizations, a board of directors composed of more than 40 key representatives of the member organizations, and an executive committee consisting of 6 elected officers of the council and 15 persons elected from the membership of the board. Meetings were held in 1950 and 1951, but, lacking a paid, full-time executive secretary and finding its officers and board members heavily burdened by other responsibilities, the council drifted into inactivity by 1952. It was reactivated at a meeting held by the board of directors in September 1954. Twenty members representing 15 organizations were present and the annual meeting was set for October.

At the October meeting, attended by 21 representatives of 16 organizations, elections of officers were held. Financial contributions toward expenses were urged, and three types of activities were authorized for the next 6 months. The projects are: (*a*) compilation and distribution of weekly and final reports on the health legislation presented in the 1955 General Assembly of Colorado; (*b*) compilation and cataloging of information on programs and activities relating to health throughout the State; and (*c*) review of the health goals set in the 1945–47 studies, together with an evaluation of the progress made since then.

Office space has been provided by the State department of public health for a part-time secretary-clerk paid by the council. The first two of the projects have been carried forward under the direction of the chief of health education of the department, president-elect of the council. The third project, or progress study, is being made by a medical representative of the Colorado Heart Association, also a member of the council.

It is expected that the three initial activities will serve as a foundation for an expanding program. Council meetings are to be held four times a year, and, presumably, financial support of the council and active participation in its activities by the member organizations will gain momentum. Thus, a new start has been made, but only a start.

In my opinion, the council, if it is to become a major force for adequate appropriations and needed legislation from year to year, should have the following: (*a*) an executive secretary; (*b*) closer working relationships with medical society committees and spokesmen; (*c*) widened associate membership among general service organizations that have an interest in health but who are also recognized as representing a broad range of public opinion; and (*d*) a central purpose, that of consolidating the support of the member organizations behind needed public health measures, whether or not they relate to a particular member's field of activity. If a united, well-informed stand could be achieved by the council, appointment of an official Colorado Health Council spokesman at the annual sessions of the legislature probably would be desirable and effective.

In addition, it seems to me that the State council could acquire many helpful ideas by holding meetings with representatives of the existing local health councils. In Weld County, Colo., for example, there are numerous community health councils. These compose a larger association called the Combined Weld County Health Council, and the association works closely with the long-established Weld County Health Department. Thus linked, the local and county organizations get the facts to the people in a variety of ways. One method

was the "Health Days," sponsored by the association, held last April 29 and 30, with meetings and exhibits at the State College of Education in Greeley, the principal city of Weld County.

Mental Health

PHR brief

Nathan Ackerman in a recent article in *Social Case Work* quotes Clifford Beers as stating in "A Mind That Found Itself" the goals of mental hygiene to be:

Encourage reforms in the care and treatment of the mentally ill.

Disseminate public information designed to increase human tolerance for those afflicted with mental illness.

Promote research into the causes, motives, and treatment of mental disorders.

Create services directed toward the prevention of mental illness.

By way of contrast, Albert Deutsch in "The Mentally Ill in America" writes that the aim of some mental health programs is to provide:

"A world of peace and freedom from which the twin spectres of war and insecurity will be banished; a world of equal opportunity where people will be freed from stunting inhibitions and 'guilt feelings' rising from outworn prejudices and taboos; a world where children may lead healthy happy lives and grow into useful well-adjusted citizens; where the personality is permitted to develop maturely and freely, where the individual is given a sense of personal worth and dignity, and where his activities and ambitions are integrated with the development of group life. . . ."

Negative Effects

The original overselling of Beers' first formulations has produced a sometimes destructive effect on public health thinking and planning. But true mental hygiene ideology cannot possibly be oversold. Rather, as Ackerman points out, some unreal premises—which might better not have been advanced—have been oversold.

For example, one can design a relatively well-defined program in only very few areas of mental health—such as in the prevention of some types of mental retardation by good prenatal health practices. But when one deals with psychoneurosis or with schizophrenia, the principles stated by Beers lead into seemingly insurmountable difficulties:

Should research be in biological areas, psychological and environmental areas, or both?

How can one create a research design to deal with so many variables?

What types of personnel should be trained?

In view of the difficulty in effecting even minor personality changes, what types of public education should be used?

In the United States

Every health official has some idea about the number of beds occupied in this country by chronic mental patients, particularly those suffering from schizophrenia and senility:

725,000 mental patients occupy nearly half of all hospital beds.

250,000 new mental patients will enter hospitals this year.

1 in every 12 children will spend some time in a mental institution.

Three-fourths of State mental hospital patients have been hospitalized for more than 2 years.

After 2 years, the odds against a patient's being released are 16 to 1.

These figures do not tell us the large numbers of mentally ill who pass through the courts or enter penal institutions. In addition, many pressing public health problems are made more complicated by the nature of the accompanying personality reactions.

Worldwide in Scope

The development of mental health programs is receiving much attention from the World Health Organization. A WHO committee has described their standard historical development.

Initially, there is mere provision of custody

By Robert L. Stubblefield, M.D., director, Psychiatric Clinic, University of Colorado School of Medicine, Denver.

for grossly disordered individuals. Then, there is provision for refuge in the shape of the insane asylum. Finally, there is the development of specific hospitals for the psychotic and of educational or working colonies for the mentally deficient.

The provision of facilities for the clinical handling of the psychoneurotics proceeds through similiar phases.

"It is very probable," the committee suggested, "that the planned application of preventive measures at a stage of a country's development earlier than they tend to develop spontaneously would reduce considerably the need for the great expenditure on therapeutic facilities which otherwise arises as development proceeds."

Integration of psychiatric personnel into a State health program might be of much more value than the traditional development of a new structure in a health unit.

Particularly pertinent to our own western States are other observations of the WHO committee. It felt that the shortage of mental health workers retarded the development of mental health programs, now designed chiefly for urban and industrial areas, and that another great need is to explore the efficacy of such programs in predominantly rural settings.

Focus on Education

Any preventive program in mental health will be related to an educational process. In my opinion, most of our educational efforts should be concentrated on the individuals who have the most significant health roles with parents and children—on the pediatrician, the general medical practitioner, the public health nurse, and others. We should focus our attention on the child's preschool, kindergarten, and early elementary school experiences.

We have no doubt of the need for accurate early diagnosis of the chronic psychiatric illnesses and suitable therapeutic centers nor about the need for a program of research in normal personality development and the various mental illnesses. We need to explore the value of community mental health centers, such as those recently developed in Massachusetts which devote much professional staff time to consultation with agencies dealing with chronic psychiatric problems.

Specific problems impede the development of preventive measures in mental hygiene. By tradition and practice, we are focused on the observation, diagnosis, and clinical treatment of an individual. Because of the length of psychotherapy and psychoanalysis we are somewhat skeptical about health education efforts. We have some stereotyped ideas about public health concepts and goals. We tend to discount psychiatric observations about the difficulties in effecting personality change and reorganization.

Public health personnel tend to move into the psychiatric team areas of function rather than to identify and publicize shortages of trained personnel and support research and training programs. But the current interest in these needs and in the development of sound programs is encouraging. I feel that we are on the verge of outstanding new positive relationships between the psychiatric disciplines and public health.

State-Local Relations

PHR brief

We are all familiar with and use, either consciously or unconsciously, certain principles in solving problems in public health. These principles—in the form of inquiry—are:

Can the problem be identified or measured?
Is there a technique which has been proved effective?
Can this technique be applied on a mass basis?
Can the results of the mass application of this technique be evaluated?
Is this technique financially feasible?

These same principles can be applied to problems of State-local relations in public health. One problem is the incomplete or inadequate definition of State and local responsibilities.

By John R. Philp, M.D., M.P.H., assistant chief, division of local health services, California State Department of Public Health.

Another aspect of State-local relations is the process of developing opinion regarding the definition of public health. This process also affects certain public health standards—technical, program, personal, financial—which, in general, are nationwide. Some of these standards may be applicable only to local areas; others represent nationwide averages and may be completely inappropriate when applied to a given community.

Recent experiences in California illustrate methods for solving or preventing problems in State-local relations. In an attempt to define the responsibilities of the State agency in public health, each bureau, each service, and each division of the State health department is delineating its activities or the activities in its field of influence under three broad categories: services performed directly by the State agency; services performed jointly by the State and local agencies; and services for which the local agency alone is responsible.

Techniques

In assisting local areas and agencies, the California State Department of Public Health is using four techniques—financial assistance, program consultation, determination of manpower requirements, and surveys of health needs and problems. All of these can be applied on a mass basis, although some selection may be necessary because of practical limitations of time.

Allocation of funds to local health jurisdictions is based on the population served. Small jurisdictions receive a relatively higher amount per capita than larger health departments. To receive funds from the State, local areas must expend a specified amount per capita per year from their own funds, and the State board of health cannot adopt any standards which a local area must meet unless they are approved by the California Conference of Local Health Officers.

Program consultation is provided by the staff of the State health department. Methods vary and are being improved with experience. Review of local health programs by a team of consultants in several specialties is undertaken at the request of the local health officer. The method to be used is discussed with and approved by the administrative staff of the local health department before plans are completed and the review is begun. This technique has been completely acceptable to local groups and leads to good State-local relations.

Estimates of manpower needs in sanitation have been made on the basis of existing problems instead of on a simple population ratio. Similar estimates will be attempted in the field of public health nursing and, eventually, for other types of professional and public health workers.

Surveys of health needs and problems in individual counties have been made on request of the counties. Teams of State health department personnel—usually a medical officer, a public health nurse, a health educator, a social worker, and sanitation personnel—visited the counties and compiled statistics and other information available in State and local agencies, made field observations of the environment and situations within the county, and interviewed selected individuals and groups. Upon completion of the survey, information from all sources was pooled and the findings reported.

Results

As a result of State financial assistance, since 1947, 16 California counties have initiated organized public health programs. No county has abandoned its public health organization. Through the conference of local health officers, a true partnership has developed between local and State agencies, and opinions of persons in the State and local health agencies regarding the team method of consultation service to local health departments indicate that help was received through the use of this technique. Final evaluation, of course, can only be made in terms of measured progress directly attributable to the use of this method. Evaluations of the relation of the State health department and the small rural counties are not complete, but analysis of the effectiveness of these methods and measurement of the results will be continued. The final answer as to the financial feasibility of these techniques can only come after further evaluation of the results obtained.

The Insurance Carrier

PHR brief

Industrial medicine once was concerned primarily with traumatic surgery or curative medicine, but in recent years the emphasis has shifted to preventive medicine. It is within this sphere that industrial medicine may produce the greatest contributions to health, as well as the greatest economic savings. Modern industrial management has come to realize that health maintenance in industry is good business. By increasing productivity and reducing employee turnover and absences, it brings increased earnings for both employer and employee.

The insurance carriers' contribution to progress in industrial medicine has been a direct outgrowth of their concern with accident prevention which reflected the need for compensating workmen for injuries suffered on the job. Today our loss prevention department employs about 400 trained people, including safety engineers, industrial hygienists, and specialists in such fields as radiation, noise, and applied research, in addition to a sizable medical staff.

Although engineering skills will continue to be important in accident prevention, they cannot control the attitude or reactions of the individual to various situations or conditions. They cannot control the actions of a preoccupied parent worrying about a sick child, an impending divorce, or an insurmountable debt. Nor can they do much to control the reactions or attitudes of one who is under par physically. A good medical program not only aids in accident prevention and occupational disease control, but can bring about marked improvement in the health of employees and their families at home. Thus, in our medical loss prevention department we now have 6 full-time physicians, 2 part-time physicians, and 24 nurses, who advise and consult with policyholders on all phases of industrial preventive medicine.

By Kenneth E. Markuson, M.D., M.P.H., division medical director, Liberty Mutual Insurance Company, Philadelphia, Pa.

The activities of our medical loss prevention department are confined chiefly to the promotion of new medical programs and the evaluation of existing programs in policyholder plants. Recommendations are based on factual data obtained from surveys and studies of the individual plants. In each instance, we attempt to design a program to fit the specific needs of the plant, whether it be a first-aid program, a plant nurse, or a complete medical service. Factors taken into consideration are: number of employees, by sex; median age of employees; type and severity of occupational exposures; absenteeism; labor turnover; job placement procedures; and seniority and health clauses in union contracts.

The recommended amount of physician and nursing time spent in the plant depends upon the number of employees and the severity of occupational exposures. We usually recommend 1 hour of nursing time per day for each 75 employees and 1 hour of physician time per week for each 50 to 75 employees.

Economic Benefits

One of the primary benefits derived from an inplant medical program stems from better case control of minor injuries and illnesses. Good case control does nothing to prevent injury or illness, but it has a marked effect on the subsequent period of disability and thus reduces compensation and medical costs for the policyholder and the insurance company, as well as wage losses for the employee. Reduction in these costs alone will often defray the expense of the medical program.

For example, in a plant employing 575 people, there were 565 man-days lost because of injury during the year preceding the installation of a medical program, with medical costs for injuries amounting to about $3,200 and compensation costs totaling $3,100. During the first year after the medical program was begun, only 168 man-days were lost as a result of injuries. Medical costs dropped to $1,450 and compensation costs to $875, a saving of $3,975. The cost of the medical program was $2,500.

Direct costs for medical care and disability,

of course, constitute only a fraction of the total costs of illness and injury. The National Association of Manufacturers has stated that each day's absence costs a plant 1½ times the daily wage, and surveys have shown that the national rate for absenteeism is 9 days per employee per year. Thus, in a plant employing 500 people at an average wage of $12 a day, the annual cost of absenteeism to the plant would be $81,000.

It would be ridiculous to assume that a medical program could reduce absenteeism to zero, but we do have several plants in which a good medical program has been able to reduce the figure by 50 percent or more. Assuming even a reduction of 25 percent, a saving of $20,250 could be realized in the aforementioned plant from control of absenteeism alone. To this are to be added the savings derived from decreased compensation costs, increased production from healthier workers, and improved morale.

The Greatest Potential

Savings in workmen's compensation are perhaps the most readily discernible benefits of an industrial medical program, but it is in the prevention of nonoccupational diseases that the greatest economic potential lies. A study by Dr. M. N. Howard, plant physician for the Socony-Vacuum Oil Co., points out the relative importance of the nonoccupational and occupational causes of disability: Of 6,092 man-days lost for medical reasons during 1949, 4.0 percent were lost because of occupational disease or injury; 6.7 percent because of nonoccupational injury; and the remainder, 89.3 percent, because of acute or chronic nonoccupational illness. Acute illness, including the common cold, accounted for 51.1 percent of the lost time, and chronic illness for 38.2 percent.

Establishing a plant medical service essentially for the control of toxic exposures is comparable to limiting service to the care of industrial injuries. Both of these services are important components of a plant medical program, but they do not embrace the broader aspects of modern industrial medicine. A modern industrial medical program should be designed to provide for adequate case control, the prevention of nonoccupational disease as well as occupational injury and disease, the control of absenteeism and labor turnover, the maintenance of effectiveness of the individual worker, and the improvement of labor-management relations.

Veterinary Medicine

PHR brief

The zoonoses, because of their relationship to disease incidence in man, have gained public health significance for veterinary medicine in the past 10 years.

Twenty-one States and four Territories created veterinary public health divisions in that period, and about 18 States now participate in a program of animal disease reporting.

Cooperation between epidemiologists and veterinarians has concentrated medical attention on many animal diseases which are communicable to man. Furthermore, certain diseases have recently been found to be transmissible to man from animals not previously implicated.

Virus diseases of veterinary public health importance include equine encephalomyelitis and psittacosis. The first is conveyed by birds or mosquitoes to both horses and man, often coincidentally. New questions about the epidemiology and transmission of psittacosis were raised when poultry plant employees developed the disease after contact with domestic turkeys. Preliminary investigations conducted by the Colorado State Department of Public Health suggest that antibody titers for psittacosis may be normal for some fraction of the population. Treatment of this disease with antibiotics temporarily inhibits antibody formation and reduces the number of reported cases.

Following the epizootics of western strain equine encephalomyelitis in Saskatchewan,

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By Martin D. Baum, D.V.M., M.P.H., chief of public health veterinary services, Colorado State Department of Public Health.

Canada, and the 1941 outbreak there, a test against neurotropic viruses was devised which helps to differentiate between poliomyelitis and encephalomyelitis. Soon after the first equine outbreak, a number of humans evidenced a central nervous disorder which was thought to be nonparalytic poliomyelitis.

What appears to be of utmost significance is the observation that a number of children affected with the western equine virus developed mental insufficiencies—in some cases, within a few weeks after the acute symptoms developed. Pursuit of studies in adults who had been affected with the disease revealed that a high percentage had died, and some had become mentally ill. Saskatchewan public health workers believe that the neutralization test should be used whenever causes of mental change in patients are obscure.

Developments in rabies control include modified live virus avianized vaccines and a hyperimmune serum to be used in conjunction with the Semple series as well as improved diagnostic techniques, such as examination of the gasserian ganglion. Studies of the propagation of sylvatic rabies among insectivorous and frugivorous bats and other wildlife are also in progress.

A 1950 report from the University of Wisconsin tended to support earlier accounts of another virus zoonosis in man. Vesicular stomatitis, once considered peculiar to swine, horses, and cattle, was diagnosed among laboratory workers.

Q fever occurs in man as a result of airborne infection, from consuming unpasteurized milk from infected cattle, and from contact with cattle, sheep, and goats. Indeed, symptomless carriers among livestock are the principal reservoir of Q fever.

Some of the bacterial diseases which may be imparted to man by livestock are leptospirosis, salmonellosis, brucellosis, bovine tuberculosis, tularemia, and anthrax. Leptospirosis and salmonellosis also are carried by several species of animals. The presence of healthy or symptomless carriers of both hinders efforts to define the distribution of these diseases. The number of leptospirosis cases is rising, but a vaccine has been developed, using 1 of the 4 leptospira serotypes which cause the disease in the United States, and field results are promising. It is possible, too, that a product effective against typhoid and salmonella carriers may become available.

Bovine tuberculosis is responsible for a condition found now and then in children and is usually diagnosed as cervical lymphadenitis. The disease persists despite measures to rid the livestock population of the condition and efforts to maintain the low infection rate of 0.5 percent enjoyed by all States. The current brucellosis incidence rate for United States cattle is 2.6 percent, enough to present a persistent public health threat.

Reports of *Vibrio fetus* in male dairy and farm workers have refuted the assumption that the malady was limited to females.

Continuing research in protozoan, mycotic, and parasitic disease control methods will undoubtedly expand the veterinary share of responsibility for public health and emphasize the place of well-trained public health veterinarians as part of the epidemiology team.

Questions in Tuberculosis

PHR brief

Within the last 10 years treatment of tuberculosis has changed notably. New surgical techniques have been developed, but more important has been the introduction of new drugs—streptomycin, para-amino salicylic acid, and isoniazid. Although there is still much to be learned about drug therapy, tuberculosis experts generally agree that it has made patients bacteriologically negative more quickly than other treatment, and that it has prolonged life and promoted healing of open lesions.

Our knowledge of tuberculosis as a disease is in a state of flux as a result of the use of these new drugs. They may conceivably have unforeseen influences on some of the indicators of tuberculosis. Does isoniazid make the tuber-

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By Robert Dyar, M.D., California State Department of Public Health.

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culosis bacillus nonpathogenic for guinea pigs in some instances? Does isoniazid reverse a tuberculin reaction? What happens if a recently converted tuberculin positive child is treated with this drug? Is it preventive?

There is some evidence that the disappearance of tubercles with drug therapy may not be permanent. If seemingly bacteriologically negative patients leave the hospital after a short period of treatment, or if they are never hospitalized at all, are they conditioned to handle themselves properly in relation to their family? Should institutional treatment be a prerequisite for home care?

Epidemiological Phenomena

Associated with the developments in therapy, though not known to be the result of the developments, are certain epidemiological phenomena of significance to public health workers. The following data from California, which I believe are indicative of what is happening throughout the country, will illustrate:

Since 1946, mortality has been declining more rapidly than morbidity. Since 1947, mortality rates have declined about 25 percent each year, but morbidity rates have decreased only about 2 percent. (There was an increase in morbidity from 1946 to 1947.)

The age-sex distribution of new cases of tuberculosis has changed. Rates in both sexes in the age groups under 5 years and 5–9 years have increased. This may be due to changes in nomenclature and morbidity reporting practices, but more likely it is because of an actual increase in cases. Rates in men 20–34 years and 55 years and over and in women 20–24 years have declined more than rates in any other age-sex specific group.

There appears to be a greater concentration of cases in terms of source. An abnormally high proportion comes from jails, penal institutions, and mental hospitals.

The total number of cases of tuberculosis reported annually is about the same each year. The number of tuberculosis hospital beds available (for subsidized care) reached a peak in 1952 and has declined about 3 percent since then. But utilization of these beds has dropped steadily since 1951, with a 10 percent drop from 1953 to 1954. At present, 1 of every 5 beds is empty. Data from selected hospitals indicate that the average length of hospital stay is declining, and there is unconfirmed evidence that fewer cases are being hospitalized initially.

Questions Raised

These epidemiological phenomena raise a number of questions that public health workers must consider if they are to fulfill their responsibilities in the control of tuberculosis. Many cannot yet be answered; many others must be answered in the light of problems and resources peculiar to each public health jurisdiction.

Indexes of control: How reliable are reported morbidity and mortality as indexes of what is happening in tuberculosis? Would not the results of periodic tuberculin testing give a better index of infectivity of tuberculosis, and indirectly of the effect of control programs?

Hospital facilities: Should we stop construction of tuberculosis hospital facilities? To what use can we put existing facilities as they are no longer needed for tuberculosis? Or can we assume that tuberculosis beds will become available for other uses?

Case finding: Is the mass survey outdated? Are surveys of selected groups justified? Should we continue routine X-ray examination of all hospital patients? Should we discard all case-finding procedures except the search for sources of infection by the case-contact investigation method? Can we rely on any single means of case finding?

Service programs: What effect does the increased responsibility for the care of tuberculosis patients in the home have on the service programs of public health? Are public health education programs geared to home care rather than hospital care? Are public health nursing services adequate in terms of skill, time, and staff to assume the increased responsibilities?

Family problems: How does the family react to the presence of a chronically ill person in the household? How is the increased load for care of the sick member absorbed by the household? Is professional help available to the patient and his family on financial, social, and emotional problems? What provision is made for the pe-

riodic determination of the infection status of children in the household?

Supervision and followup: Should followup procedures for the patients treated at home differ from those for the hospital patient? Are the tuberculosis registers providing the greater detail necessary to insure proper supervision of the patient at home?

It seems that present trends in the treatment of tuberculosis are shifting much of the burden from hospitals to health departments. If health departments are to meet their new responsibilities, they must review conscientiously their professional services and administrative procedures to be sure they are adapted to the problems of home care. They must review critically their present activities in order to eliminate the unnecessary and provide time for increased attention to tuberculosis. Additional staff, particularly nurses and social workers, may be necessary. Tuberculosis is a disease of rapidly declining mortality, but our best efforts will be required to erase the final, and most persistent, evidences of it. This is no time to view tuberculosis with complacence.

Water Treatment Trends

PHR brief

Population growth, urban concentrations, increased consumption of water for cleaning, bathing, and gardening, occasional drought, and industrial uses of water have placed heavy burdens on the water supply. These burdens are greatly influencing water treatment.

Dallas, Tex., last year developed an emergency supply of water from the Red River, 60 miles away. The waterworks people were obliged to work out a solution for the treatment of this water of poor quality without the benefit of an appropriate treatment plant.

By H. W. Poston, senior sanitary engineer, Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

Tastes and Odors

The removal of tastes and odors from water is not at all helped by meager knowledge concerning the causative agents and the lack of definitive terms for describing odors. It is believed that most tastes and odors come from minute amounts of complex organic compounds. Actinomycetes, closely related to bacteria and fungi, are claimed by Silvey to be the source for unpleasant tastes and odors in water. Control over the conditions of reservoirs—keeping them clean and eliminating marginal and littoral vegetation—would destroy the main food sources for these organisms, he states.

The organic compounds recovered in the experimental work at the Robert A. Taft Sanitary Engineering Center are tested in distilled water to reproduce specific tastes and odors.

A musty component in water, probably an ester, has been recovered from the Ohio, Mississippi, and Scioto Rivers and the Great Lakes. Appearing to be of natural origin, it is not thought to be a product of industrial wastes.

Detergents

Coagulation problems associated with detergents have been reported in many localities. In Kansas, Culp and Stoltenberg found that synthetic detergents present in raw water to the extent of 3.0 to 3.5 p.p.m. would interfere with treatment. Gallaher reported similar difficulties in Wisconsin. Todd in West Virginia experienced foam to a depth of 4 feet on the raw water basin, difficulty in coagulation and settling, inability to remove iron, and failure to remove taste even when chlorine dioxide was increased to 4 times normal.

Langelier and co-workers conducted coagulation studies using sequestering agents such as sodium hexametaphosphate. Smith, Walton, and Cohen recently found that household detergents may cause difficulty in raw water coagulation at water treatment plants drawing on a surface supply. As the use of detergents con-

tinues to expand, their effects must be studied further.

Filtration

Necessarily, filter rates of over 2 gallons per minute per square foot are used in many plants during periods of heavy demand. Usually, at these times, the water is warm and coagulation problems are minimal. In many plants, water applied to filters meets the requirements of the Public Health Service's Drinking Water Standards insofar as turbidity and bacteria are concerned, owing to good coagulation and chlorination.

Baylis at Chicago, experimenting with filtration rates up to 5 g.p.m./sq.ft., concludes that, for water not high in turbidity and turbid waters properly conditioned, a filtration rate averaging 4 g.p.m./sq.ft., but not exceeding 5, will produce an acceptable effluent. The main reason for setting the maximum rate at 5 g.p.m./sq.ft. is the high initial cost of head occurring at higher rates rather than the passage of flocculated matter through the filter beds.

Jackson, reporting on the Dalecarlia Filter Plant (Washington, D. C.), concluded that water meeting the present standards of chemical quality, turbidity, and bacteriological purity can be produced at rates up to 5 g.p.m./sq.ft. over a range of temperature from 50° to 72° F., provided efficient pretreatment is maintained, superior free residual chlorination is employed, and qualified operating personnel are available. At high rates, anthracite (0.76 mm.) demonstrated more favorable characteristics than did sand (0.56 mm.) with regard to all phases of head loss, flow, and length of run, Jackson concluded.

Fluorides

Controlled fluoridation now applies to 1,000 water supply systems serving 20 million people. The fluoride content is maintained between 0.6 and 1.2 p.p.m. More than 500 communities are using water which contains a natural excess of fluorides. Pilot plant studies indicate that calcined alumina in contact beds was effective in limiting fluorides to a desirable level with low operating and construction costs. Other exchange media that can be used for fluoride reduction include calcium phosphates, anion exchange resins, and magnesium. The selection of a particular medium is based on local conditions, cost, water analysis, and capacity required.

Water Quality

Methods for determination of bacteriological water quality have not kept pace with the needs. A rapid and accurate technique has long been desired.

The Chicago Department of Water makes use of the electron microscope in obtaining rapid identification of coliform organisms, a method not practicable for most water supplies. The latest edition of Standard Methods of Water Analysis describes a tentative procedure using the membrane filter for enumeration of these organisms. This is essentially the method described by Jeter, Geldreich, and Clark in the April 1955 issue of the *Journal of the American Water Works Association*. By this method only 16 to 18 hours are required for a complete coliform test whereas 24 to 72 hours are required when using the MPN procedure. Large samples of water containing low coliform density can be concentrated by this direct-plating method.

Civil Defense Needs

Water supply methods for civil defense are not much different from normal objectives. They are merely intensified by large-scale evacuation of heavily populated areas, necessitating additional water supply at emergency evacuation centers. These emergency supplies must be available immediately if evacuees are to be kept from drinking from contaminated sources. Each area has a problem of locating sources prior to any emergency and of providing treatment.

The hazard of water contaminated by radioactive fallout material will not decrease as rapidly as the radioactivity in the water decreases, owing to the fact that the most dangerous of the radioisotopes capable of lodging in the body have relatively long half-lives. It may be dangerous to drink such water long after the

external radiation from fallout has decayed to innocuous levels.

Standard water treatment processes have been found to be of limited value in removing soluble radioactive materials from the water. If the radioactivity is not so closely associated with particulate matter as to be removed with the particles, expensive treatment such as ion-exchange or distillation might be necessary to produce safe drinking water.

Micro-organisms that might be used as biological warfare agents may include pathogenic bacteria, fungi, rickettsiae, viruses, and protozoa. These might be disseminated by the enemy in air, water, food, or by any other route that would permit the BW agent to reach the oral and respiratory tracts, or to penetrate the skin.

According to Berger and Stevenson, a BW attack may not be accompanied by readily detectable changes in the physical characteristics of the water. They say that substantial free chlorine residuals in important segments of the distribution system represent the best current means of protection—which may not be complete, however, under all possible circumstances. Current routine bacteriological water quality examinations are not useful in detecting the presence of BW material.

Chemical warfare agents are considered less attractive as intentional water contaminants than a number of biological agents. Nerve gases, among the most toxic chemicals known, are one or two orders less toxic than some of the BW agents. Their toxic effects are felt promptly. The Army has developed and tested methods for removing nerve gases from water. Kits are available for detection of various chemicals in water.

The possibility that unknown chemical agents may be available may revise this estimate of a lack of serious threat to water supplies from CW agents.

PHS Advisory Council Appointments

Dr. Joseph F. Volker, Dr. J. Roy Doty, and Edward Y. Blewett were appointed October 1, 1955, to 4-year terms on the National Advisory Council, National Institute of Dental Research. Upon recommendations of the council, which is composed of 12 men outstanding in science, education, and public affairs, the Surgeon General of the Public Health Service awards grants to dental schools, universities, and other non-Federal institutions conducting research on diseases of the mouth and teeth.

Dr. Volker, president-elect of the International Association of Dental Research, is dean of the School of Dentistry and director of research and graduate study, University of Alabama Medical Center. Formerly professor of clinical dentistry and then dean, Tufts College School of Dentistry, from 1942 to 1948, at times over the past 9 years he has served as dental consultant to Czechoslovakia, Germany, Thailand, and Jamaica.

Dr. Doty is secretary of the Council on Therapeutics, American Dental Association, with which he has been associated since 1943. He is the 1954 recipient of the distinguished alumni award of Monmouth College, Monmouth, Ill., from which he was graduated in 1927 and where he instructed in chemistry for 3 years. He was also associated with Louisiana State University School of Medicine, first as instructor and later as assistant professor of physiology. He is the author of numerous scientific articles.

Mr. Blewett has been dean of the College of Liberal Arts, University of New Hampshire, since 1939. In the preceding 12 years he served in numerous other posts at the university, as assistant to the president, alumni secretary, director of the summer session, and executive secretary of the university. He is a member of the executive committee of the New England Association of Colleges and Secondary Schools and in 1948 and 1949 was chairman of the arts and sciences' division, Association of Land Grant Colleges and Universities.